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# SEMI-ANNUAL STATUS REPORT NO. 1

# **OLIN CHEMICAL SUPERFUND SITE**

51 EAMES STREET WILMINGTON, MASSACHUSETTS

Submitted to:

# United States Environmental Protection Agency

Region I – New England One Congress Street Boston, Massachusetts 02114

Submitted by: Olin Corporation 1186 Lower River Road Charleston, Tennessee 37310

Prepared by:



MACTEC Engineering and Consulting, Inc. 107 Audubon Road, Suite 301 Wakefield, Massachusetts 01880

Project No. 6300-06-0011 / 81.17

January 2, 2008

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Peter Thompson with Ramission

Project Manager

Michael J. Murphy

Project Principal

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## **GLOSSARY OF ACRONYMS**

AOC Agreement of Consent

AS/SVE air sparging/soil vapor extraction

BEHP bis(2-ethylhexyl)phthalate

DAPL dense aqueous phase liquid

FS Feasibility Study

IRA Immediate Response Action IRS Interim Response Steps

IRSWP Interim Response Steps Work Plan

LNAPL light non-aqueous phase liquid

MACTEC Engineering and Consulting, Inc.

MCP Massachusetts Contingency Plan

MSL mean sea level

NDPA N-nitrosodiphenylamine

Olin Corporation

O&M Operation and Maintenance off-PWD off-Property West Ditch

PCMP Post-Construction Monitoring Plan

RAM Release Abatement Measure RGP Remediation General Permit

RI/FS Remedial Investigation and Feasibility Study

SASR Semi-Annual Status Report Site The Olin Chemical Superfund Site

SPCC Spill Prevention, Control and Countermeasure Plan

SVOC semi-volatile organic compound

TAG Technical Assistance Grant

USEPA United States Environmental Protection Agency

UV ultraviolet

VOC volatile organic compounds VPH volatile petroleum hydrocarbons

#### 1.0 INTRODUCTION

This Semi-Annual Status Report (SASR) has been prepared for the Olin Chemical Superfund Site (the Site) in Wilmington, Massachusetts on behalf of Olin Corporation (Olin) by MACTEC Engineering and Consulting Inc., (MACTEC). The SASR has been prepared consistent with Section II.C. of the Statement of Work, Remedial Investigation and Feasibility Study (RI/FS), Olin Chemical Superfund Site, prepared by the United States Environmental Protection Agency (USEPA) Region I – New England and dated June 2007 (USEPA, 2007a). This SASR summarizes the field activities that have occurred between July and November 2007; the only field activities that occurred during that time period have been conducted under the Draft Interim Response Steps Work Plan (IRSWP), submitted to USEPA in July 2007 (MACTEC, 2007).

The Site includes, but is not limited to, the property at 51 Eames Street, Wilmington, MA. The site location is presented in **Figure 1-1**. The approximately 50-acre property is the site of a former chemical manufacturing plant, which was purchased by Olin in 1980. **Figure 1-2** is a site plan that identifies the three areas that are described in the Draft IRSWP (Slurry Wall/Cap Containment Area, Plant B and the off-Property West Ditch [off-PWD] area). This SASR discusses field activities for those three areas which are ongoing Interim Response Steps (IRS) as described in the Draft IRSWP.

The three specific IRSs are summarized below and include:

- Slurry Wall/Cap monitoring of groundwater and surface water in the area surrounding the Slurry Wall and inspection of the temporary cap;
- Plant B operation, maintenance and monitoring of the groundwater recovery/treatment system that was designed to remove and control migration of light non-aqueous phase liquid (LNAPL); and
- Dense Aqueous Phase Liquid (DAPL) Extraction Pilot Test in the off-PWD Area which for 2007 included continuing efforts on a DAPL Extraction Pilot Test Design.

Each of these IRSs has specific objectives and each was initiated to address previously completed or planned future remedial actions. General descriptions of each of the IRSs are presented in the following paragraphs.

The Slurry Wall/Cap is a containment structure that was constructed in 2000 as a Release Abatement Measure (RAM) consistent with the Massachusetts Contingency Plan (MCP). The intent of this source control action was to eliminate, to the extent feasible, the on-Property DAPL source material as a source of dissolved constituents to groundwater. The containment structure

is comprised of a perimeter slurry wall keyed into bedrock and a temporary cap to minimize infiltration of precipitation into the containment area. Construction of the slurry wall was preceded by a pre-design boring program to determine the depth to bedrock. The slurry wall contains to the maximum extent practicable, the on-Property DAPL and overlying groundwater located within the containment structure. Along the northern, eastern and southern portions of the slurry wall, the DAPL contained within the perimeter of the slurry wall is at an elevation below the point where the slurry wall is keyed into bedrock. On the western, up gradient side of the slurry wall, a gravel equalization window was constructed in the top of the slurry wall to maintain equal hydraulic pressure between groundwater inside and outside of the containment structure. The temporary cap is a scrim reinforced polyethylene sheet cover held in place by sandbags. The physical condition of the temporary cap has been routinely inspected and to identify areas where repairs are necessary. Monitoring of groundwater quality within and around the perimeter of the containment structure and monitoring of surface water quality in the adjacent surface water features (South Ditch and off-PWD) has been conducted since construction of the Slurry Wall/Cap to characterize the long-term effect of this source control measure.

The Plant B groundwater recovery/treatment system has been in operation and its performance has been monitored since 1981 with continued operation from 1997 to present as an Immediate Response Action (IRA) under the MCP. The system was installed in response to the seepage of LNAPL into the East Ditch that is located at the eastern perimeter of the former facility property. The LNAPL is a processing oil that contains bis(2-ethylhexyl)phthalate (BEHP), Nnitrosodiphenylamine (NDPA) and trimethylpentenes. The system was designed to create a groundwater cone of depression to prevent migration of the LNAPL and allow for mechanical removal of the material. During its operation, various in-situ technologies have also been applied to enhance removal of LNAPL and dissolved phase constituents, including air sparging/soil vapor extraction (AS/SVE) and bio-stimulation. These additional measures were applied successfully and resulted in a large increase in the rate of contaminant mass removal. The cumulative effect of these remedial measures has been to remove the majority of recoverable LNAPL from the subsurface. As a result, the LNAPL recovery rate has remained low, warranting evaluation of the efficacy of further LNAPL recovery efforts. Groundwater extracted during operation of the system is treated to remove iron and ammonia as well as dissolved organic compounds. The treated groundwater is discharged to surface water on the former facility property in compliance with a Remediation General Permit (RGP). Visual observations of the East Ditch, LNAPL gauging in monitoring and interceptor wells, sampling and analysis of the treatment system influent and effluent and groundwater monitoring have been components of the monitoring program for Plant B.

The DAPL Extraction Pilot Test (Pilot Test) is planned to determine the feasibility of extraction and off-site disposal of DAPL from the area immediately to the west of the Slurry Wall/Cap containment area (in the vicinity of the off-PWD). The DAPL pool in this area is a source of dissolved constituents to groundwater that flows toward and discharges, in part, to the Upper South Ditch, located on the former facility property. The Pilot Test will be conducted at the off-PWD area to evaluate the technical feasibility of DAPL extraction. The Pilot Test will include the extraction and off-Site disposal of DAPL material and completion of a monitoring program to document existing groundwater conditions prior to start up, as well as, monitoring of groundwater conditions throughout the Pilot Test. The results of the Pilot Test will be used in the Feasibility Study (FS) to support evaluation of remedial alternatives.

The scope of this SASR includes presentation of the results of surface water, sediment and groundwater sampling and a tabulation of water level data. For the Slurry Wall/Cap and Plant B, this SASR provides a tabulation of analytical data that has been validated to date for the sampling events within the monitoring period of the report (the third quarter event). This report provides a general discussion concerning whether these data are consistent with prior results. For Plant B, this SASR also includes a tabulation of the monthly water level and product recovery data and plots of interpreted groundwater levels and product thickness for the past five months since the Agreement of Consent (AOC) Effective Date. In addition, this reports documents the field data collection activities which are summarized in field activity reports for each sampling event (including the Slurry Wall/Cap and Plant B) and included in Appendix A. These reports describe the sampling event and present figures and tables concerning:

- locations sampled and the analytical program;
- final field parameters for groundwater and surface water sampling;
- synoptic groundwater elevations;
- field instrument calibration records;
- field data records:
- chain of custody records; and
- temporary cap inspection and photographic logs.

On an annual basis, coinciding with the AOC Effective Date, the data presented in the SASR will be more fully evaluated, including presentation of time series plots. For the Slurry Wall/Cap, the annual report will also include estimation of groundwater and solute mass flux through the

equalization window, interpretation of groundwater potentiometric surfaces and gradients, presentation of data logger measurements to compare groundwater elevations to precipitation, presentation of time series plots for groundwater and surface water quality and discussion of sediment data. For Plant B, on an annual basis, data will also include cumulative, monthly and annual time series plots of LNAPL recovered and documentation of any pumping rate adjustments and water level and LNAPL responses to such changes.

This SASR is organized as follows:

Section 1.0 – Introduction

Section 2.0 – Slurry Wall/Cap

Section 3.0 – Plant B

Section 4.0 – DAPL Extraction Pilot Test

Section 5.0 – Additional Activities

Appendix A – Interim Response Steps Field Activity Reports

A-1 Third Quarter 2007 Sampling Event

A-2 Fourth Quarter 2007 Sampling Event

Appendix B – Data Validation Memorandums – Third Quarter 2007 Sampling Event

Appendix C – Weir Monthly Inspection Reports – BSC Group, Inc.

Appendix D - Annual Status Report for Plant B Area Remediation Systems - Shaw

## 2.0 SLURRY WALL/CAP

The following sections present results of chemical analysis for groundwater and surface water for the third quarter sampling event. Analytical results from the fourth quarter sampling event were not available at the time of report preparation. Synoptic water level data are presented in field activity reports contained in Appendices A-1 and A-2. The third quarter data validation report is provided in Appendix B-1.

In addition to the quarterly sampling conducted in accordance with the Draft IRSWP, Olin personnel conducted weekly observations of the weir and South Ditch and recorded observations concerning wildlife, surface water conditions and flocculent accumulation. These reports are reviewed monthly by the BCS Group, Inc and compiled as a monthly report by the BCS Group, Inc. These reports are contained in Appendix C.

#### 2.1 GROUNDWATER

Two sample rounds were conducted this period including the third quarter event completed August 21-23, 2007, and the fourth quarter event completed November 12-16, 2007.

The third quarter sampling event collected groundwater samples from three groundwater monitoring wells (GW-25, GW-202S, GW-79S) and three stream piezometers (PZ-16RR, PZ-17RR, PZ-18RR). The fourth quarter sampling event collected groundwater samples from sixteen groundwater locations (GW-34D, GW-34SR, GW-35S, GW-10S, GW-24, GW-25, GW-26, GW-42S, GW-39, GW-55S, GW-78S, GW-79S, GW-202S, GW-202D, GW-201S, GW-CA1) and three stream piezometers (PZ-16RR, PZ-17RR, PZ-18RR). The sample locations, details of sampling and the analytical program are contained in the field activities reports in Appendices A-1 and A-2. Groundwater samples were analyzed for aluminum, chromium, ammonia, chloride, sulfate and specific conductance.

**Table 2-1** presents analytical results for third quarter groundwater sampling. The analytical results for the fourth quarter sampling event were being received from the laboratory at the time this report was being prepared. Validation of that data is not complete; therefore, the fourth quarter data are not included in this report. The analytical results for aluminum, chromium, ammonia, chloride, sulfate and specific conductance are consistent with past results.

Synoptic water levels were collected from twenty groundwater monitor well locations and three stream piezometers prior to each sampling event. These wells include the eighteen well locations sampled for chemical analysis and two additional piezometers PZ-24 and PZ-25. Water level measurements are tabulated in Appendix A-1 and A-2. These measurements are also shown on **Figures 2-1 and 2-2**. The third quarter synoptic water levels show shallow groundwater flowing from the west around both the northern and southern sides of the slurry wall consistent with prior data. The fourth quarter shows a groundwater flow similar flow pattern, although groundwater conditions in the northern most well (GW-34SR) are higher than wells to the west, indicating a possible flow component from the north to the west during this measurement period. Along the south side of the Slurry Wall, shallow groundwater flows toward Upper South Ditch.

Vertical gradients from deep to shallow overburden were upward north of the Slurry Wall (GW-34SR and GW-34D) and downward in the Ephemeral drainage during both measurement rounds (GW-55S and GW-55D). Near South Ditch groundwater gradients in shallow and deeper overburden groundwater (GW-202S and GW-202D) were weakly upward during the third quarter and strongly downward during the fourth quarter.

During a Site visit conducted in October, it was observed that the lower outlet pipe in the storm water detention basin was clogged and that water levels had risen to the upper outlet. Measurement of water elevation in the sedimentation pond was not specified in the Draft IRSWP because it was not a component of the former Post-Construction Monitoring Plan (PCMP) under the MCP. Therefore, the water elevation in the storm water detention pond is not known at the time of the synoptic water level measurements. The invert elevation of the lower inlet is 80.25 feet above mean sea level (MSL) and the elevation of the upper invert is 82.11 feet MSL. Based on water level information in surrounding wells, the elevation of water in the storm water detention pond may locally affect groundwater elevations along the south side of the Slurry Wall. Maintenance has been scheduled to clear the lower outlet pipe in December 2007. Water levels in the sedimentation pond will be measured in the future, referenced from either the upper or lower outlet invert or a staff gauge will be installed.

In July 2007, new data loggers were purchased (Solinst® Levelloggers) and deployed in wells GW-10S, GW-35S, GW-76S, GW-78S and GW-CA1 in August 2007. A systematic programming error was made in the start-up time setting and the loggers failed to start and no data was recorded for period between late-August and mid-November. A review of procedures was completed and a

corrective action now requires that the data logger be checked independently after deployment by the field operations leader. The data loggers were checked on December 14, 2007, and are operating properly.

#### 2.2 SURFACE WATER

The third and fourth quarter sampling events collected surface water samples from seven locations: ISCO1, ISCO2, ISCO3, PZ-16RR/PZ-16RSW, PZ-17RR, PZ-18R and SD-17. These samples were analyzed for aluminum, chromium, sulfate, chloride, sodium, ammonia, nitrate, nitrite and specific conductance. Both unfiltered and filtered surface water samples were collected and analyzed for metals (aluminum, chromium, sodium). The sample locations, details of sampling and the analytical program are contained in the field activities reports in Appendices A-1 and A-2.

**Table 2-2** presents analytical results for third quarter surface water sampling. The analytical results for the fourth quarter sampling event were being received from the laboratory at the time this report was being prepared. Validation of that data is not complete; therefore, the fourth quarter data are not included in this report. The third quarter analytical results for aluminum, chromium, ammonia, chloride, sulfate and specific conductance are consistent with past results.

#### 2.3 SEDIMENT

Sediment samples were collected during the fourth quarter sampling event from five locations: SD-SD1, SD-SD2, SD-SD3, SD-SD4 and SD-SD5. These samples were analyzed for aluminum, chromium, iron and percent solids. The analytical results for the fourth quarter sampling event were being received from the laboratory at the time this report was being prepared. Validation of that data is not complete; therefore, the fourth quarter data are not included in this report.

## 2.4 TEMPORARY CAP INSPECTIONS

Inspections of the temporary cap have been conducted in August and November 2007 as part of the third and fourth quarter sampling events. Full descriptions of the temporary cap inspections, including any necessary repairs completed on the temporary cap, are included in the Field Activity Reports in Appendix A.

The general physical condition of the polyethylene cap is good considering its age and service conditions (direct exposure to sunlight and the elements). All observed holes and perforations were repaired with a repair tape.

Ponded water was observed in different areas of the cap. The presence of ponded water does not necessarily signify leakage in those ponded areas. The presence of ponded water suggests that the underlying polyethylene sheeting is intact and is not leaking. Much of the water loss from ponded areas is probably due to evaporation. Sections of sewn seams that are submerged below water have the potential for a small amount of leakage due to the construction of the seam. The general pattern of ponded water on the cover is consistent with older survey data of the temporary cap area. The cap is internally graded to a drain which outlets to the sedimentation basin located to the south between the containment area and South Ditch.

Some deterioration of the sand bags was observed during the inspections. This deterioration of the sand bags does not adversely affect their purpose which is to place weight on the cover to resist wind uplift forces. The sand has not migrated from the cover, and the sand weight, with the additional weight of the small areas of ponded water, are adequate to protect the polyethylene sheet from wind uplift and related wind damage. There is no need to replace the sandbags.

The polyethylene sheet has serviceable life remaining and will continue to perform its intended function until such time as the ultraviolet (UV) protection afforded by its carbon black content fails to protect the polymer from significant deterioration.

#### 3.0 PLANT B

The following sections present results of chemical analysis for groundwater for the third quarter sampling event. Analytical results were not available at the time of report preparation for the fourth quarter sampling event. Synoptic water level data are presented in the field activity reports in Appendices A-1 and A-2.

In addition to the quarterly sampling conducted in accordance with the Draft IRSWP, Olin personnel collected monthly water level, LNAPL thickness and LNAPL recovery data and tested the treatment plant influent and effluent in accordance with the RGP. This analysis includes volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total metals (iron), ammonia, total phenols and residual chorine. The analytical program for the RGP was described in the Draft IRSWP (MACTEC 2007). The analytical data for the RGP is validated and retained on-Property by Olin in accordance with that permit. That data is not included in this report. The monthly water level and LNAPL thickness data, collected since the AOC Effective Date, is presented in this SASR in tables and figures.

In addition to this information, Shaw Group prepares annually a summary report for Olin concerning the remedial systems operated at Plant B over the course of the year. That report is contained in Appendix D.

### 3.1 GROUNDWATER

Two sample rounds were conducted this period including the third quarter event completed August 21-23, 2007, and the fourth quarter event completed November 12-16, 2007.

The third quarter sampling event collected groundwater samples from GW-16, which is done quarterly. The fourth quarter sampling event is the annual event (end of year) and groundwater samples are collected from six wells (GW-16, B-03, GW-101, GW-13, IW-10 and IW-6). The monitoring well groundwater samples are analyzed for trimethylpentenes, NDPA, BEHP, volatile petroleum hydrocarbons (VPHs), ammonia, iron and pH. The sample locations, details of sampling and the analytical program are contained in the field activities reports in Appendices A-1 and A-2.

**Table 3-1** presents analytical results for third quarter groundwater sampling. The analytical results for the fourth quarter sampling event were being received from the laboratory at the time this report

was being prepared. Validation of that data is not complete; therefore, the fourth quarter data are not included in this report. The third quarter analytical results for trimethylpentenes, NDPA, BEHP, VPH, ammonia, iron and pH are consistent with past results.

Groundwater levels are measured by Olin on a monthly frequency in 26 monitoring wells and the three groundwater extraction wells. The monthly water table elevation data are presented in **Tables 3-2 and 3-3** and in **Figures 3-1 through 3-5** for July through November. A smaller subset of wells are included in the quarterly synoptic water levels program, and those data are tabulated in Appendices A-1 and A-2.

#### 3.2 LNAPL

LNAPL thickness is measured on a monthly basis. The number of wells with measurable LNAPL thickness during each sampling event varies as the LNAPL layer is very thin and is sporadically detected in certain individual wells from month to month. The LNAPL thickness data are presented in **Tables 3-2 and 3-3** and in **Figures 3-6 through 3-10** for July through November. Over the most recent two years, LNAPL has been observed in seven observation wells and two of the three groundwater extractions wells. Measurable LNAPL has always been collected from GW-23 near the northeast corner of the Plant B foundation. Measurable LNAPL has also been collected frequently from the nearby well P5 and extraction well IW-11. The frequency and location of detected LNAPL may have some bearing on future recoverability of remaining LNAPL.

The monthly LNAPL recovery data is presented in **Tables 3-2 and 3-3** for the July through November 2007 time period. The highest amount of LNAPL recovered during this time period was 0.73 gallons in July 2007. The total LNAPL recovered for 2007 to date 2.41 gallons and represents a slight increase in the total LNAPL recovered during either of the two preceding years. The recovery unit from IW-11 was removed and cleaned on November 27, 2007.

## 4.0 DAPL EXTRACTION PILOT TEST DESIGN

The Draft IRSWP schedule for the DAPL Extraction Pilot Test Design called for design kick-off meeting and preparation of an internal 60% design and submittal of that design for internal Olin review. In addition, an initial Spill Prevention, Control and Countermeasures (SPCC) Plan was to be drafted, based on that design, to help evaluated safety considerations built into the design.

#### 4.1 KICK-OFF MEETING

A design kick-off meeting was held on September 11, 2007, at the Property in Wilmington, Massachusetts. The meeting included MACTEC's project manager and lead design engineer and Olin's operation and maintenance (O&M) and Site management team.

The topics covered at the design meeting included:

- Design deliverable and construction delivery options;
- Chemical data needs for DAPL characteristics;
- Pipeline, Spill Containment and Run-on Control and Management;
- Site Security and Emergency Notification; and
- Process and Instrumentation Components.

Based on these discussions, several decisions were made as discussed below.

The deliverable process would include a design build approach, whereby the 60% design would be reviewed by Olin and revised to the point where discussions with potential bidders and the property owner could be initiated. This process would expedite the design and construction schedule.

A sample of DAPL will be taken to determine the freezing point as this factor will affect the depth of burial of the conveyance pipeline and operational considerations during freezing weather. Sufficient data is present on DAPL chemistry and viscosity to specify containment materials and pumps. Use of a sequestering agent would not be evaluated at this time, but may require evaluation based on operational characteristics of the system.

Issues related to spill detection and containment and control of fresh water run-on are inter-related in several of the design components. It was decided that existing topography around the rail car loading area would provide natural containment of a catastrophic spill and that the design should focus on more reasonable incidental spill control. Thus, it was decided that a spill pan under the

rail car be connected to a spill sump, an approximate 4-foot diameter manhole. An automatic system shut-off controller in the sump will be considered. It was also determined that a roof cover over the fill area of the rail car would be included in the design to keep storm water/snow out of the spill pan and sump and to provide for safe O&M in inclement weather conditions. The dual contained pipeline design would include an adequate number of inspection/clean-out manholes and shorter pipe runs for ease of pipe replacement. For scaling purposes, the design would consider using a larger carrier and containment pipe (1-1/2-inch inside and 4-inch outside). Water-tight manhole or access covers would be needed as well as electrical outlets for O&M. Within the pump house, a sump around the extraction well would be provided with the floor slab sloped toward the sump. An automatic shut-off controller in the sump will also be included in case a failure occurred in the pump head drive tubing. A drain hole back into well at a level just below top of sump would also be provided.

For site security, the design would consider using a web-cam to allow constant monitoring of the loading area from a remote computer in the event of an alarm condition. This would allow for improved response decisions in the event of an emergency condition. In addition, the security fence would be extended around the rail car with a double slide gate with a man gate to the Olin Property side.

For instrumentation and electrical considerations at the rail car, the design would provide for a high level pump shut-off, high level alarm and high-high level alarm. Notification would be by auto dialer to O&M personnel. This type of notifications would also be considered for other spill detection measures in the sump and pump house areas. The design would need to determine an appropriate flow measurement meter for the peristaltic pump. As a manual check, the design would provide a "T" with valve for timed manual flow check. For safety considerations and O&M, power outlets would be provided in the pump house enclosure, at each inspection/clean-out manhole and at the loading platform. Lighting would be provided in the pump house enclosure and at the loading platform. A portable eyewash would be provided at the loading station.

#### 4.2 DESIGN PROGRESS

The 60% internal design drawings were completed in the second week of November and provided to Olin for review and comment. These design drawings provide the basis to draft an initial SPCC plan. On November 2, 2007, USEPA provided comments on the Draft IRSWP which requested evaluation of other DAPL loading and transport options (USEPA, 2007b). In early December, Olin

requested MACTEC to initiate conceptual designs using fractional tanks and tanker trucks to store and transport DAPL from a location near the extraction well. Four design concepts are in process, evaluating options using existing and new road openings to access that area of the property.

#### 4.3 SPILL PREVENTION, CONTROL AND COUNTERMEAURES (SPCC) PLAN

An internal draft SPCC Plan was developed in early to mid-December 2007. The purpose of this plan is to assist the design and safety review process in formulating design elements that are appropriate for the methods, locations and manner in which the recovered DAPL material will be managed. Based on USEPA comments on the Draft IRSWP, this SPCC plan has been structured to accommodate either a rail transport or a truck transport design option (USEPA, 2007).

The SPCC Plan describes measures to be implemented by Olin to prevent chemical discharges from occurring and to prepare Olin to respond in a safe, effective and timely manner to mitigate the impacts of a discharge at the off-PWD DAPL Pilot Area. This SPCC Plan has been prepared and will be implemented in consideration with the SPCC requirements contained in the USEPA Title 40 Code of Federal Regulations Part 112, Oil Pollution Prevention (40 CFR 112) and contingency plan requirements contained within Title 310 Code of Massachusetts Regulations Chapter 30 Hazardous Waste, Section 341- General Accumulation Standards for Large Quantity Generators (310 CMR 30). Although each of these regulations is not directly "applicable" to the DAPL Extraction Pilot Test, they are considered "relevant and appropriate" regulations.

#### 4.4 SCHEDULE

A revised design schedule is currently being proposed in the response to USEPA comments on the Draft IRSWP. The response to comments document was delivered on the same date as this SASR.

## 5.0 ADDITIONAL ACTIVITIES

#### 5.1 SUBMITTALS

Since the AOC Effective Date, Olin has submitted to the USEPA the Draft IRSWP (on July 25, 2007) and the Draft Focused RI Report (on October 1, 2007) for USEPA review. The Draft IRSWP described the IRSs to be conducted at the site in advance of the RI field activities. The Draft Focused RI report summarized all the studies and field activities that had been conducted at the site under the MCP.

#### 5.2 MEETINGS

Olin has been involved in several meetings since July 2007. On August 20, 2007, and October 11, 2007, Olin participated in the Technical Assistance Grant (TAG) meetings with USEPA. Representatives of Olin also participated in the public meeting, held on September 5, 2007, which updated residents on the status of the remedial investigation at the site. On October 3, 2007, Olin met with USEPA to discuss preliminary comments of the IRSWP. On October 10, 2007, Olin hosted a stakeholders meeting to review the organization and scope of the recently submitted Draft Focused RI Report. Then on November 7, 2007, Olin met with EPA to present a web-based tool for USEPA to use for accessing data from the Olin Wilmington database.

# 6.0 REFERENCES

- MACTEC Engineering and Consulting, Inc. (MACTEC), 2007. *Draft Interim Response Steps Work Plan*, Olin Chemical Superfund Site, Wilmington, Massachusetts. July 25.
- United States Environmental Protection Agency (USEPA), 2007a. Statement of Work Remedial Investigation and Feasibility Study, Olin Chemical Superfund Site. Final. June 2.
- USEPA, 2007b. *Review of DRAFT Interim Response Steps Work Plan*, Olin Chemical Superfund Site, Wilmington, Massachusetts. November 7.

6-1

# **TABLES**

Table 2-1
Slurry Wall / Cap Analytical Results for Third Quarter Groundwater Sampling
Semi-Annual Status Report No. 1
Olin Chemical Superfund Site
Wilmington, Massachusetts

	Frequency of	Range of Nondetect	Range of Detected	Average of All	GW202S DUP GW-202S	GW-202S GW-202S	GW-25 GW-25	GW-79S GW-79S	PZ16RR PZ-16RR
ParameterName	Detection	Concentrations	Concentrations	Samples	8/21/2007	8/21/2007	8/21/2007	8/21/2007	8/21/2007
Metals, Filtered (mg/L)									
Aluminum, Filtered	1 / 7	0.1 : 0.1	0.0089 - 0.0089	0.044129	< 0.1	< 0.1	0.0089 J	< 0.1	< 0.1
Chromium, Filtered	7 / 7		0.0024 - 0.015	0.007214	0.0045 J	0.0045 J	0.015	0.0061	0.005
Inorganics (mg/L)									
Chloride	7 / 7		27 - 260	116.4286	90	91	260	110	190
Nitrogen, Ammonia	7 / 7		21 - 160	83	94	100	81	68	160
Specific Conductance (umhos/cm)	7 / 7		470 - 2400	1610	1900	1900	2000	1200	2400
Sulfate as SO4	7 / 7		57 - 670	428.1429	650	670	490	260	440
Field Measurements									
pH (pH units)	6 / 6		6.33 - 7.26	6.816667		6.38	6.78	6.33	7.16
Dissolved Oxygen (mg/L)	5 / 6	0.1 : 0.1	0 - 8.23	2.928333		0.88	0	0.81	8.23
Oxidation Reduction Potential (mv)	6 / 6		-212 - 60	-137.8333		60	-148	-212	-180
Specific Conductance (umhos/cm)	6 / 6		357 - 2390	1532.833		1930	1120	2020	2390

Table 2-1
Slurry Wall / Cap Analytical Results for Third Quarter Groundwater Sampling
Semi-Annual Status Report No. 1
Olin Chemical Superfund Site
Wilmington, Massachusetts

	PZ17RR	PZ18R
	PZ-17RR	PZ-18R
ParameterName	8/21/2007	8/21/2007
Metals, Filtered (mg/L)		
Aluminum, Filtered	< 0.1	< 0.1
Chromium, Filtered	0.0024 J	0.013
Inorganics (mg/L)		
Chloride	27	47
Nitrogen, Ammonia	57	21
Specific Conductance (umhos/cm)	1400	470
Sulfate as SO4	430	57
Field Measurements		
pH (pH units)	7.26	6.99
Dissolved Oxygen (mg/L)	7.6	< 0.1
Oxidation Reduction Potential (mv)	-138	-209
Specific Conductance (umhos/cm)	1380	357

Table 2-2
Slurry Wall / Cap Analytical Results for Third Quarter Surface Water Sampling
Semi-Annual Status Report No. 1
Olin Chemical Superfund Site
Wilmington, Massachusetts

	Frequ	iency of	Range o	of Nondetec	Range	of Detected	Average of	ISCO-1 ISCO1	ISCO-1 DUP	ISCO-2 ISCO2	ISCO-3 ISCO3	PZ-16 RSW PZ-16RSW	PZ-17RR PZ-17RR
ParameterName	-	ection		oncentrations		entrations	All Samples	8/22/2007	8/22/2007	8/22/2007	8/22/2007	8/22/2007	8/22/2007
Metals, Total (mg/L)													
Aluminum, Total	8	/ 8			0.094	- 6.3	1.8	0.094 J	0.1	2.3	0.27	6.3	2.7
Chromium, Total	8	/ 8			0.012	- 1.5	0.41	0.013	0.013	0.42	0.027	1.5	0.64
Sodium, Total	8	/ 8			43	- 180	100	46 J	43 J	110	49 J	180 J	160
Metals, Filtered (mg/L)													
Aluminum, Filtered	8	/ 8			0.0061	- 0.063	0.025	0.0072 J	0.0085 J	0.063 J	0.0061 J	0.046 J	0.026 J
Chromium, Filtered	7	/ 8	0.005	: 0.005	0.0034	- 0.057	0.018	0.0034 J	0.0036 J	0.007	< 0.005	0.057	0.034
Sodium, Filtered	8	/ 8			51	- 200	113	51 J	51 J	120	61 J	200 J	170
Inorganics (mg/L)													
Chloride	8	/ 8			76	- 390	223	78	76	220	150	350	390
Nitrate as N	8	/ 8			0.68	- 5.6	2.8	0.93	0.93	3.5	0.68	3.7	4.5
Nitrite as N	2	/ 8	0.05	: 0.1	0.1	- 0.1	0.059	0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nitrogen, Ammonia	8	/ 8			4.8	- 81	29.2	14	15	48	4.8	81	31
Specific Conductance (umhos/cm)	8	/ 8			510	- 2400	1223	510	520	1400	690	2400	1800
Sulfate as SO4	8	/ 8			50	- 650	205	76	75	330	50	650	210
Field Measurements													
pH (pH units)	6	/ 6			5.56	- 6.72	6.19	6.72		6	5.56	6.67	5.92
Dissolved Oxygen (mg/L)	6	/ 6			4.45	- 11.35	8.21	8.07		4.45	11.35	10.5	7.3
Oxidation Reduction Potential (mv)	6	/ 6			-117	- 5	-48.5	5		-64	-16	-40	-117
Specific Conductance (umhos/cm)	6	/ 6			401	- 2810	1559	401		1650	534	2810	2040

Table 2-2
Slurry Wall / Cap Analytical Results for Third Quarter Surface Water Sampling
Semi-Annual Status Report No. 1
Olin Chemical Superfund Site
Wilmington, Massachusetts

	PZ18R	SD-17
	PZ-18R	SD-17
ParameterName	8/23/2007	8/22/2007
Metals, Total (mg/L)		
Aluminum, Total	0.1	2.9
Chromium, Total	0.012	0.68
Sodium, Total	61 J	150 J
Metals, Filtered (mg/L)		
Aluminum, Filtered	0.017 J	0.026 J
Chromium, Filtered	0.0038 J	0.029
Sodium, Filtered	77 J	170 J
Inorganics (mg/L)		
Chloride	150	370
Nitrate as N	2.2	5.6
Nitrite as N	< 0.1	< 0.05
Nitrogen, Ammonia	13	27
Specific Conductance (umhos/cm)	760	1700
Sulfate as SO4	71	180
Field Measurements		
pH (pH units)		6.29
Dissolved Oxygen (mg/L)		7.6
Oxidation Reduction Potential (mv)		-59
Specific Conductance (umhos/cm)		1920

# Table 3-1 Plant B Analytical Results for Third Quarter Groundwater Sampling Semi-Annual Status Report No. 1 Olin Chemical Superfund Site Wilmington, Massachusetts

	Frequency of Range of Nondetect				Pange	of F	Detected	Average of All	GW16 GW-16	GW16 DUP GW-16		
ParameterName			-	_			_		rations	Samples	8/21/2007	8/21/2007
Volatile Organics (mg/L)							JI 1(I	ations	Campics	0/21/2007	0/2 1/2001	
2,4,4-Trimethyl-1-pentene	2	1	2				0.29	_	0.34	0.315	0.29 J	0.34 J
2,4,4-Trimethyl-2-Pentene	2	1	2				0.085	-	0.11	0.0975	0.085	
Semivolatile Organics (mg/L)												
bis(2-EthylHexyl)phthalate	0	1	2	0.0051	:	0.0052				0.002575	< 0.0052	< 0.0051
N-Nitrosodiphenylamine	2	1	2				0.14	-	0.16	0.15	0.16 J	0.14 J
Metals, Filtered (mg/L)												
Iron, Filtered	2	1	2				0.8	-	0.81	0.805	0.81	0.8
Inorganics (mg/L)												
Nitrogen, Ammonia	2	/	2				5.9	-	5.9	5.9	5.9	5.9
pH (pH units)	2	/	2				5.96	-	6.03	5.995	5.96 J	6.03 J
VPH (mg/L)												
Benzene	0	/	2	0.005	:	0.005				0.0025	< 0.005	< 0.005
Ethylbenzene	0	1	2	0.005	:	0.005				0.0025	< 0.005	< 0.005
m,p-Xylene	0	/	2	0.01	:	0.01				0.005	< 0.01	< 0.01
Methyl-t-butyl ether (MTBE)	0	1	2	0.005	:	0.005				0.0025	< 0.005	< 0.005
Naphthalene	0	1	2	0.01	:	0.01				0.005	< 0.01	< 0.01
o-Xylene	1	1	2	0.005	:	0.005	0.0052	-	0.0052	0.00385	< 0.005	0.0052
Toluene	0	1	2	0.005	:	0.005				0.0025	< 0.005	< 0.005
C5-C8 Aliphatics (FID)	2	1	2				0.77	-	0.81	0.79	0.81	0.77
C5-C8 Aliphatics, Unadjusted	2	1	2				0.77	-	0.81	0.79	0.81	0.77
C9-C10 Aromatics (PID)	0	1	2	0.1	:	0.1				0.05	< 0.1	< 0.1
C9-C12 Aliphatics (FID)	0	1	2	0.1	:	0.1				0.05	< 0.1	< 0.1
C9-C12 Aliphatics, Unadjusted	0	1	2	0.1	:	0.1				0.05	< 0.1	< 0.1
VPH Concentration (Total)	2	1	2				0.77	-	0.81	0.79	0.81	0.77
Field Measurements												
pH (pH units)	1	1	1				5.29	-	5.29	5.29	5.29	
Dissolved Oxygen (mg/L)	1	/	1				2.56	_	2.56	2.56 113	2.56	
Oxidation Reduction Potential (mv)	1	1	1				113	113 - 113			113	
Specific Conductance (umhos/cm)	1	/	1				118	-	118	118	118	

mg/L - milligrams/liter umhos/cm - micromhos/centimeter mv - millivolts

Table 3-2
Plant B Water Level and LNAPL Data - June - August 2007 
Semi-Annual Status Report No. 1
Olin Chemical Superfund Site
Wilmington, Massachusetts

	ı	Depth to Water		D	epth to Produc	ct	Pr	oduct Thickne	ess	Reference	Potentiomet	ric Surface Elevat	ion (feet NGVD)	Pi	roduct Remov	ed	
Well		feet <sup>2</sup>			feet <sup>3</sup>			feet <sup>3,4</sup>		Elevation	С	orrected for Prod	uct <sup>5</sup>		gallons		Well
$ID^2$	6/29/2007	7/30/2007	8/31/2007	6/29/2007	7/30/2007	8/31/2007	6/29/2007	7/30/2007	8/31/2007	feet	6/29/2007	7/30/2007	8/31/2007	6/29/2007	7/30/2007	8/31/2007	$ID^2$
B-2		12.54	12.77		NPD	NPD		NA	NA	90.48		77.94	77.71				B-2
B-3	-	12.39	12.72		NPD	NPD		NA	NA	90.32		77.93	77.60				B-3
B-5R	-	12.72	13.27		NPD	NPD		NA	NA	91.38		78.66	78.11				B-5R
B-7A		NM	9.92		NPD	NPD		NA	NA	88.81		NM	78.89				B-7A
B-17	-	11.02	11.88		NPD	NPD		NA	NA	91.55		80.53	79.67				B-17
GW-13 <sup>6</sup>	-	12.38	12.75		NPD	NPD		NA	NA	90.57		78.19	77.82				GW-13 <sup>6</sup>
GW-14	1	10.40	10.72		NPD	NPD		NA	NA	88.70	-	78.30	77.98				GW-14
GW-15 <sup>6</sup>	1	10.43	10.98		NPD	NPD		NA	NA	90.01	-	79.58	79.03				GW-15 <sup>6</sup>
GW-16 <sup>6</sup>		10.87	11.62		NPD	NPD		NA	NA	91.21		80.34	79.59				GW-16 <sup>6</sup>
GW-23	-	13.42	13.65		13.42	13.65		Trace	Trace	91.04		77.63	77.40				GW-23
GW-52S <sup>6</sup>		9.71	10.10		NPD	NPD		NA	NA	87.95		78.24	77.85				GW-52S <sup>6</sup>
GW-100		12.35	12.64		NPD	NPD		NA	NA	90.15		77.80	77.51				GW-100
GW-101	-	12.65	12.85		NPD	NPD		NA	NA	90.14		77.49	77.29				GW-101
GW-102	-	11.38	11.54		NPD	NPD		NA	NA	89.00		77.62	77.46				GW-102
IW-1	1	12.89	13.24		NPD	NPD		NA	NA	90.71	-	77.82	77.47				IW-1
IW-2		12.90	13.20		12.90	13.20		Trace	Trace	90.53		77.64	77.34				IW-2
IW-3		12.78	13.18		NPD	NPD		NA	NA	90.76		77.98	77.58				IW-3
IW-6	1	NM	11.86		NPD	NPD		NA	NA	89.15		NM	77.29				IW-6
IW-7 <sup>6</sup>	-	12.70	12.94		NPD	NPD		NA	NA	90.10		77.40	77.16				IW-7 <sup>6</sup>
IW-8 <sup>6</sup>		12.61	12.87		NPD	NPD		NA	NA	89.94		77.33	77.07				IW-8 <sup>6</sup>
IW-9 <sup>6</sup>		12.22	12.57		NPD	NPD		NA	NA	89.78		77.56	77.21				IW-9 <sup>6</sup>
IW-10 <sup>6</sup>		12.69	12.91		NPD	NPD		NA	NA	90.43		77.74	77.52				IW-10 <sup>6</sup>
IW-11		16.50	17.18		NPD	NPD		NA	NA	89.92		73.42	72.74		0.73	0.27	IW-11
IW-12		14.42	14.56		NPD	NPD		NA	NA	90.31		75.89	75.75				IW-12
IW-13		19.00	19.15		NPD	NPD		NA	NA	89.90		70.90	70.75				IW-13
PID		12.71	12.98		NPD	NPD		NA	NA	89.97		77.26	76.99				PID
P5	1	12.93	13.22		12.93	13.22		Trace	Trace	90.45	-	77.53	77.24				P5
12-IN	1	NM	12.50		NPD	NPD		NA	NA	89.84	-	NM	77.34				12-IN
SG		NM	NM		NPD	NPD		NA	NA	79.25		NM	NM				SG
											Reco	vered Product Fo	r Month		0.73	0.27	

Notes: NPD - No Product Detected; NA - Not Applicable; Trace - Less than one-hundredth of a gallon

1 - Ground water and product elevation data and oil removed collected by Olin .

2 - Measurement collected from top of PVC. If well does not have PVC casing, measurement from top of steel casing.

3 - Collected using ORS brand oil/water interface probe.

4 - Sheens noted at wells are assigned a product thickness of 0.01 feet

5 - Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))

6 - New top of casing reference elevations surveyed by Dana Perkins 4/98-5/98. Other wells resurveyed 11/97 following upgrades and repairs.

-- - June data is not shown. Only data collected after the consent date is included.

Table 3-3

Plant B Water Level and LNAPL Data - September - November 2007 

Semi-Annual Status Report No. 1

Olin Chemical Superfund Site

Wilmington, Massachusetts

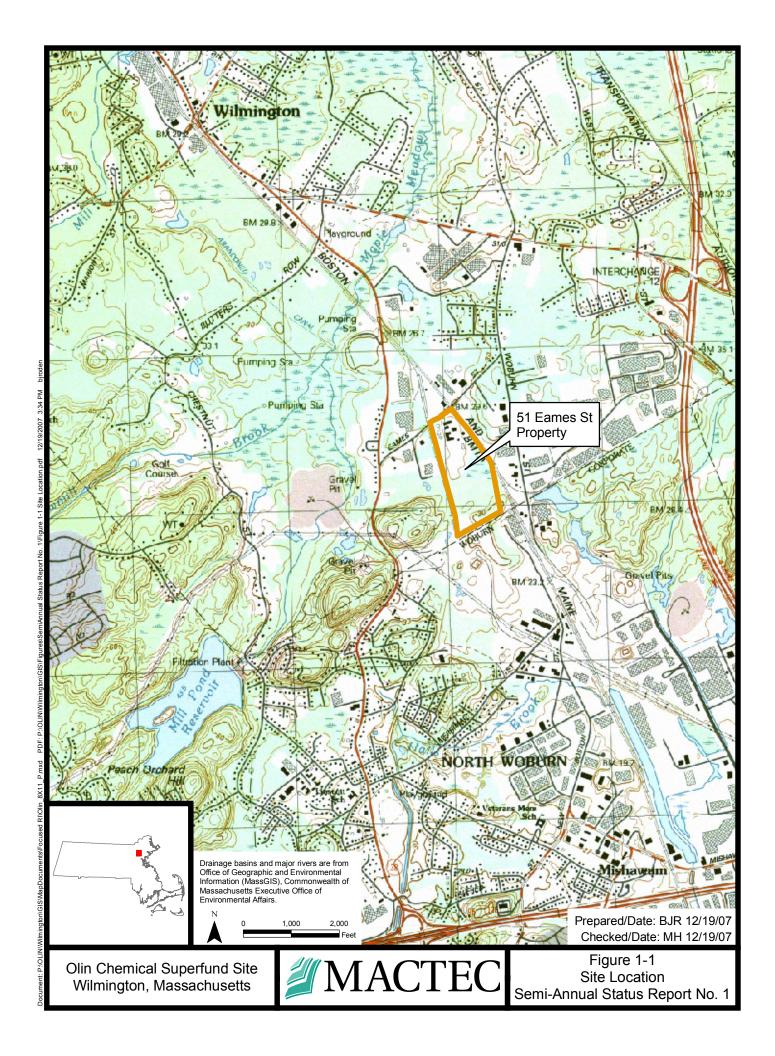
		Depth to Water	r	1	Depth to Produc	et	Р	roduct Thickne	ss	Reference	Potentiome	etric Surface Ele	evation (feet NGVD)	Р	roduct Remove	ed	
Well		feet <sup>2</sup>			feet <sup>3</sup>			feet <sup>3,4</sup>		Elevation		Corrected for P	roduct <sup>5</sup>		gallons		Well
ID <sup>2</sup>	9/28/2007	10/31/2007	11/30/2007	9/28/2007	10/31/2007	11/30/2007	9/28/2007	10/31/2007	11/30/2007	feet	9/28/2007	10/31/2007	11/30/2007	9/28/2007	10/31/2007	11/30/2007	ID <sup>2</sup>
B-2	12.69	12.63	12.40	NPD	NPD	NPD	NA	NA	NA	90.48	77.79	77.85	78.08				B-2
B-3	12.73	12.58	12.27	NPD	NPD	NPD	NA	NA	NA	90.32	77.59	77.74	78.05				B-3
B-5R	13.11	13.25	12.85	NPD	NPD	NPD	NA	NA	NA	91.38	78.27	78.13	78.53				B-5R
B-7A	9.87	10.06	9.53	NPD	NPD	NPD	NA	NA	NA	88.81	78.94	78.75	79.28				B-7A
B-17	11.59	11.87	10.85	NPD	NPD	NPD	NA	NA	NA	91.55	79.96	79.68	80.70				B-17
GW-13 <sup>6</sup>	12.54	12.59	12.36	NPD	NPD	NPD	NA	NA	NA	90.57	78.03	77.98	78.21				GW-13 <sup>6</sup>
GW-14	10.66	10.67	10.33	NPD	NPD	NPD	NA	NA	NA	88.70	78.04	78.03	78.37				GW-14
GW-15 <sup>6</sup>	10.91	11.02	10.00	NPD	NPD	NPD	NA	NA	NA	90.01	79.10	78.99	80.01				GW-15 <sup>6</sup>
GW-16 <sup>6</sup>	11.38	11.84	NM	NPD	NPD	NM	NA	NA	NM	91.21	79.83	79.37	NM				GW-16 <sup>6</sup>
GW-23	13.53	13.56	13.49	13.53	13.56	13.49	Trace	Trace	Trace	91.04	77.52	77.49	77.56				GW-23
GW-52S <sup>6</sup>	10.09	10.03	9.65	NPD	NPD	NPD	NA	NA	NA	87.95	77.86	77.92	78.30				GW-52S <sup>6</sup>
GW-100	12.38	12.50	12.31	NPD	NPD	NPD	NA	NA	NA	90.15	77.77	77.65	77.84				GW-100
GW-101	12.62	12.73	12.42	NPD	NPD	NPD	NA	NA	NA	90.14	77.52	77.41	77.72				GW-101
GW-102	11.39	11.46	11.12	NPD	NPD	NPD	NA	NA	NA	89.00	77.61	77.54	77.88				GW-102
IW-1	13.12	13.20	12.74	NPD	NPD	NPD	NA	NA	NA	90.71	77.59	77.51	77.97				IW-1
IW-2	13.00	12.88	13.71	13.00	NPD	NPD	Trace	NA	NA	90.53	77.54	77.65	76.82				IW-2
IW-3	13.05	12.85	12.69	NPD	NPD	NPD	NA	NA	NA	90.76	77.71	77.91	78.07				IW-3
IW-6	11.84	11.71	11.47	NPD	NPD	NPD	NA	NA	NA	89.15	77.31	77.44	77.68				IW-6
IW-7 <sup>6</sup>	12.89	12.77	12.58	NPD	NPD	NPD	NA	NA	NA	90.10	77.21	77.33	77.52				IW-7 <sup>6</sup>
IW-8 <sup>6</sup>	12.81	12.67	12.43	NPD	NPD	NPD	NA	NA	NA	89.94	77.13	77.27	77.51				IW-8 <sup>6</sup>
IW-9 <sup>6</sup>	12.36	12.37	12.18	NPD	NPD	NPD	NA	NA	NA	89.78	77.42	77.41	77.60				IW-9 <sup>6</sup>
IW-10 <sup>6</sup>	12.84	12.71	12.53	NPD	NPD	NPD	NA	NA	NA	90.43	77.59	77.72	77.90				IW-10 <sup>6</sup>
IW-11	16.88	16.41	16.58	NPD	NPD	NPD	NA	NA	NA	89.92	73.04	73.51	73.34	0.13	0.29		IW-11
IW-12	14.50	14.34	14.08	NPD	NPD	NPD	NA	NA	NA	90.31	75.81	75.97	76.23				IW-12
IW-13	19.11	16.71	16.23	NPD	NPD	NPD	NA	NA	NA	89.90	70.79	73.19	73.67				IW-13
PID	12.93	12.78	12.58	NPD	NPD	NPD	NA	NA	NA	89.97	77.04	77.19	77.39				PID
P5	13.16	13.40	13.77	13.16	NPD	NPD	Trace	NA	NA	90.45	77.30	77.05	76.68				P5
12-IN	12.43	12.40	11.97	NPD	NPD	NPD	NA	NA	NA	89.84	77.41	77.44	77.87				12-IN
SG <sup>7,8</sup>	NM	NM	NM	NPD	NPD	NPD	NA	NA	NA	80.67	NM	NM	NM				SG <sup>7,8</sup>
											Red	covered Produc	t For Month	0.13	0.29	0.0	

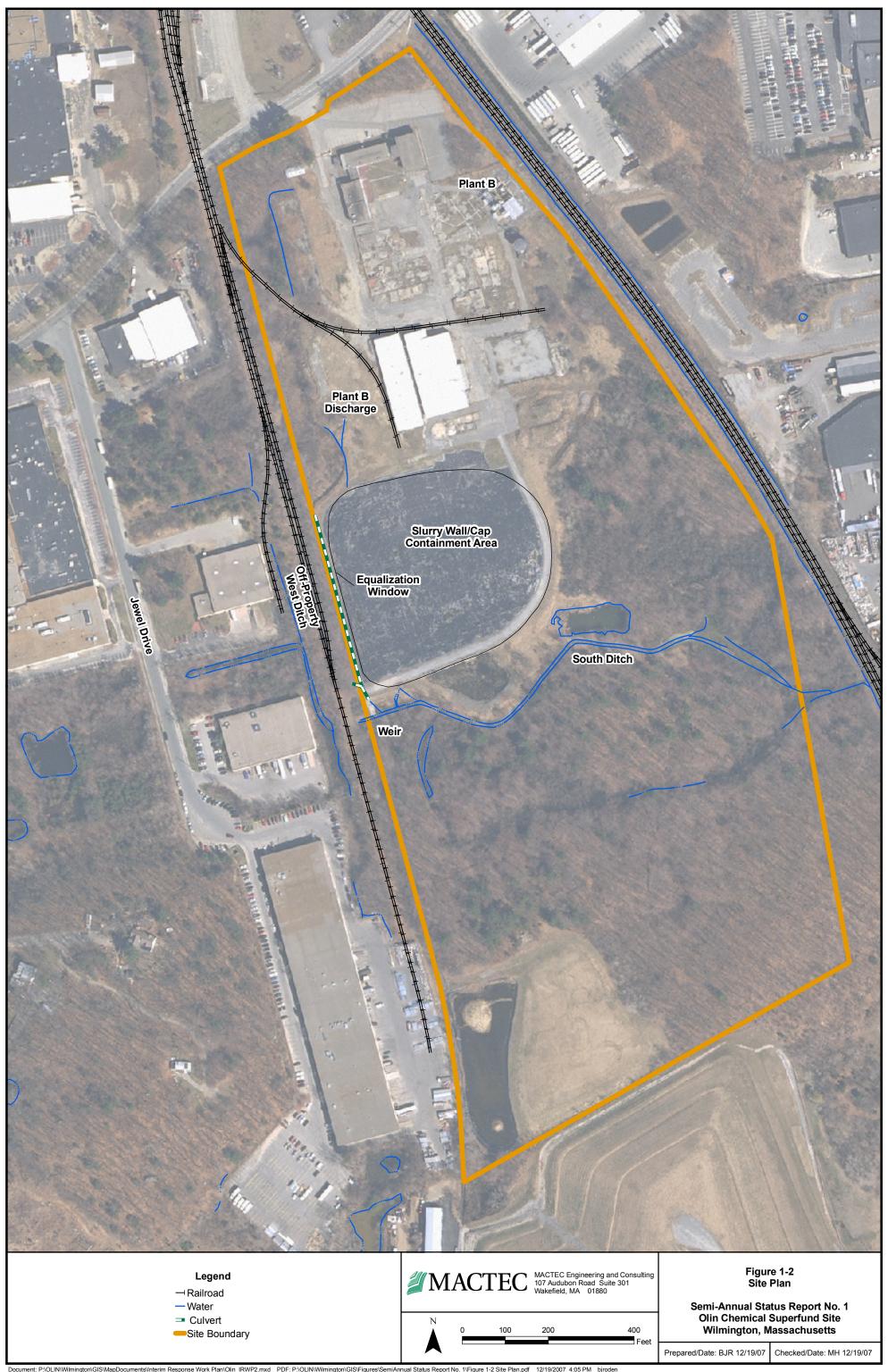
Notes: NPD - No Product Detected; NA - Not Applicable; Trace - Less than one-hundredth of a gallon;

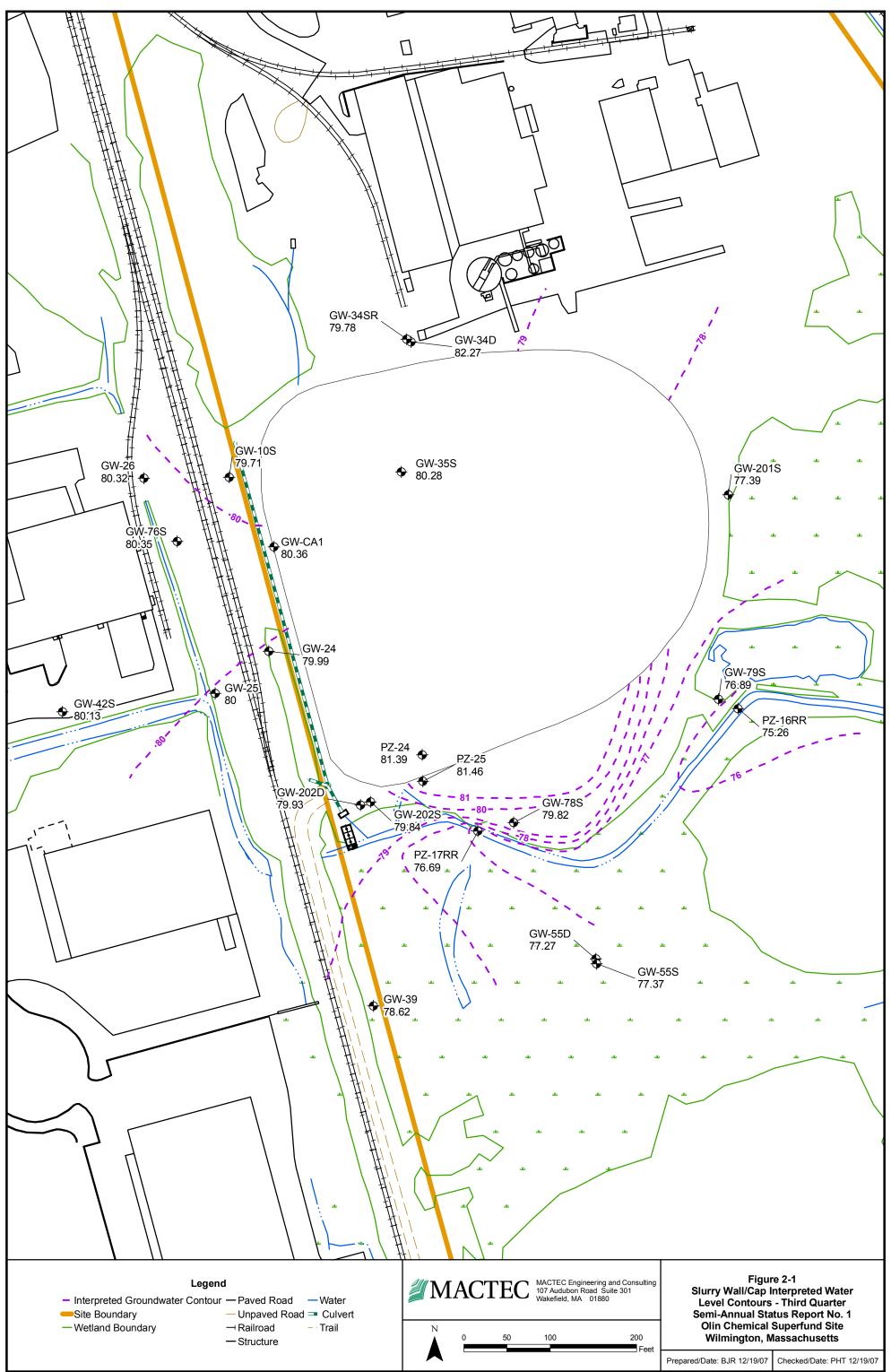
- 1 September and October ground water and product elevation data and oil removed collected by Olin; November data collected by MACTEC
- 2 Measurement collected from top of PVC. If well does not have PVC casing, measurement from top of steel casing.
- 3 Collected using ORS brand oil/water interface probe.
- 4 Sheens noted at wells are assigned a product thickness of 0.01 feet
- 5 Correction equation used: Reference elevation (depth to water (product thickness X 0.95))
- 6 New top of casing reference elevations surveyed by Dana Perkins 4/98-5/98. Other wells resurveyed 11/97 following upgrades and repairs.

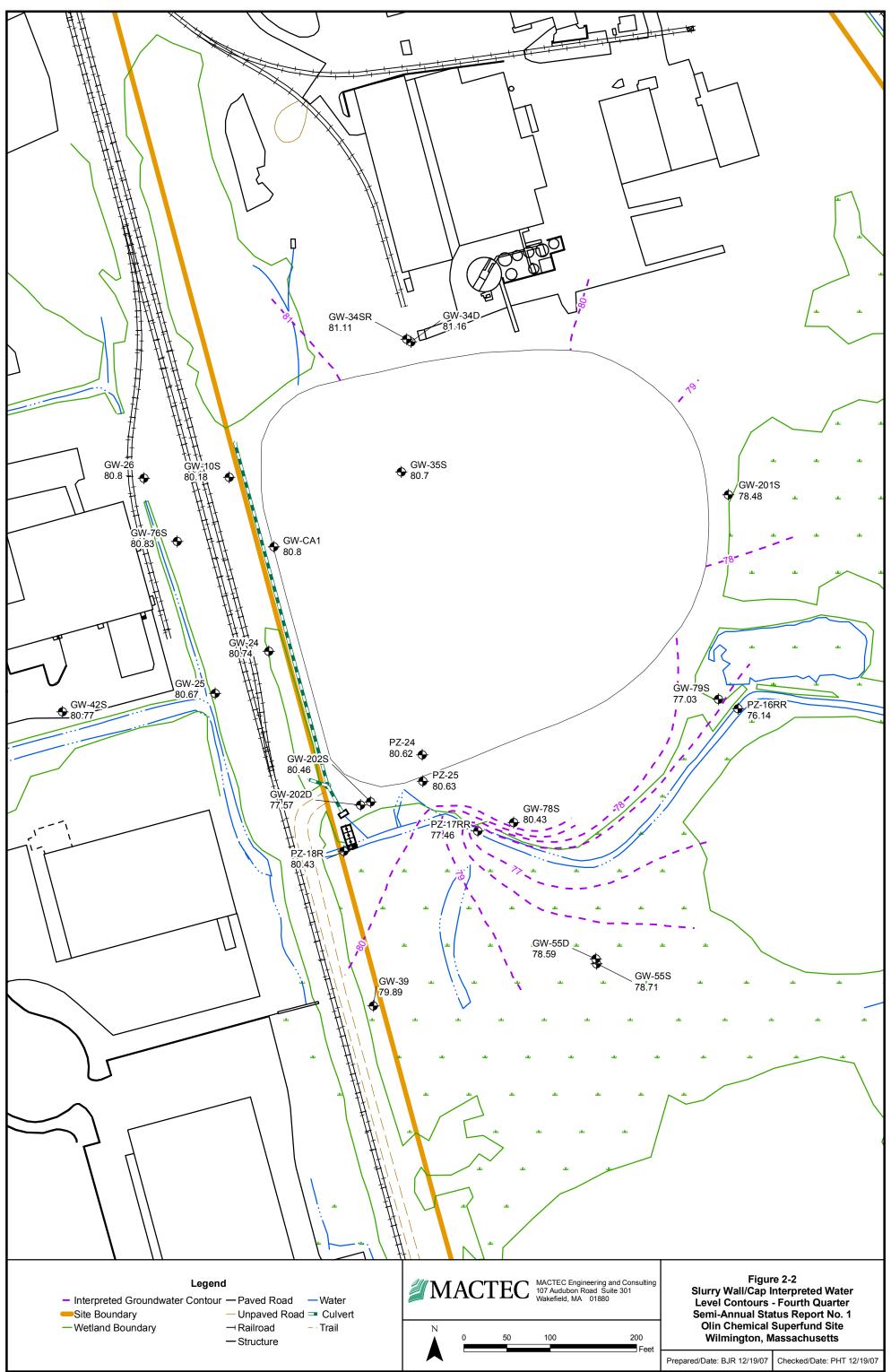
NM - Not Measured

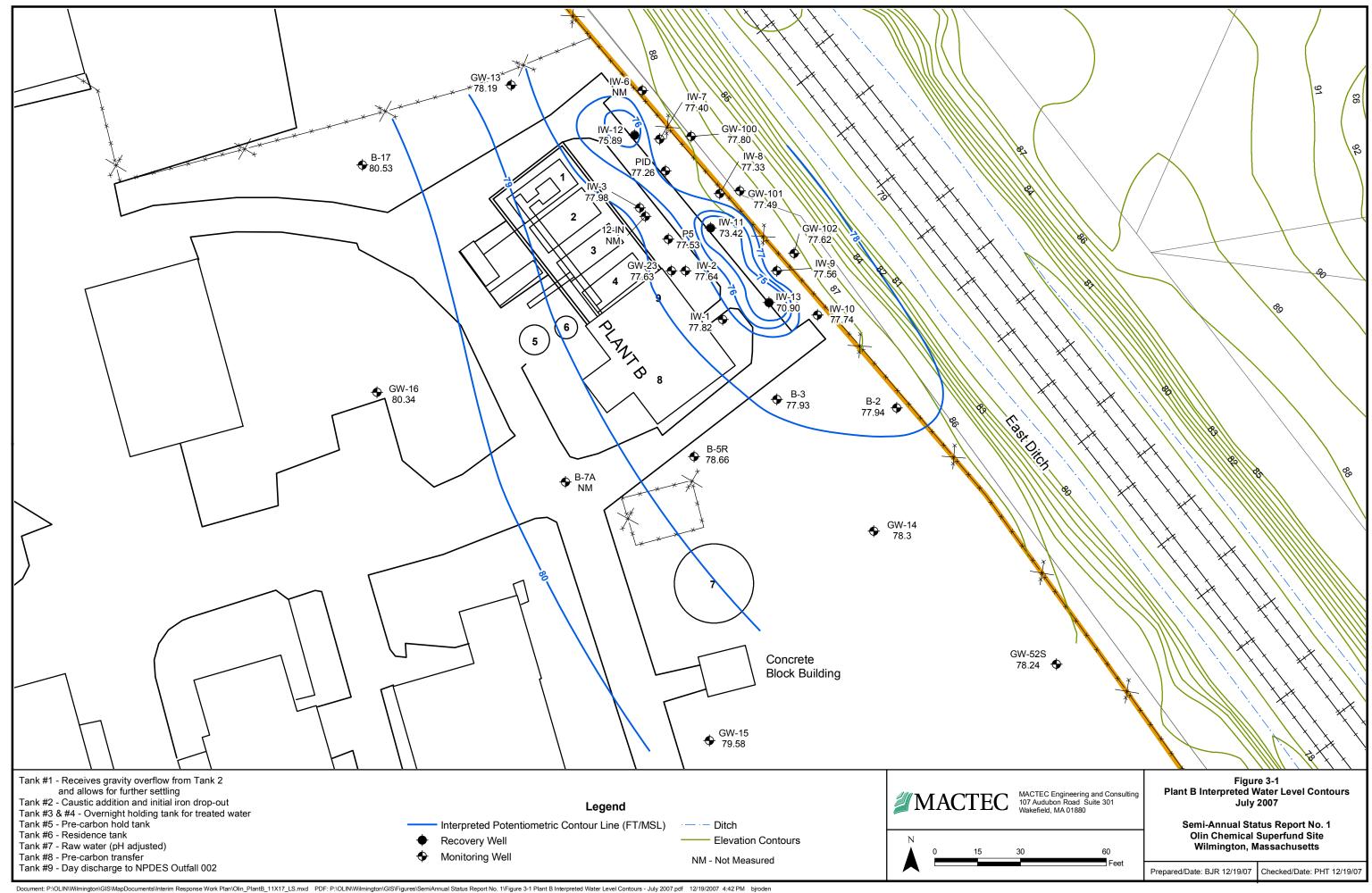
# **FIGURES**

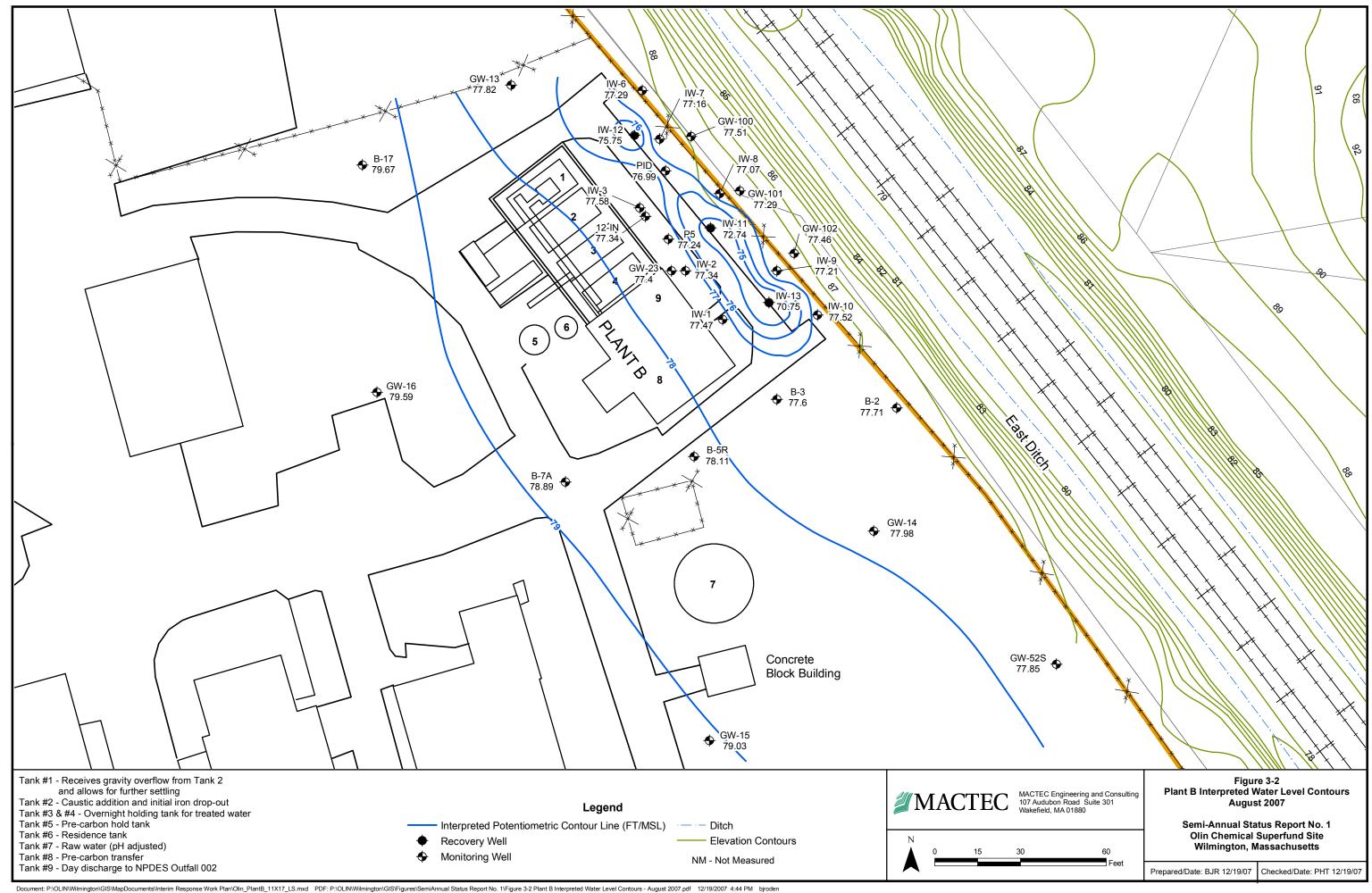


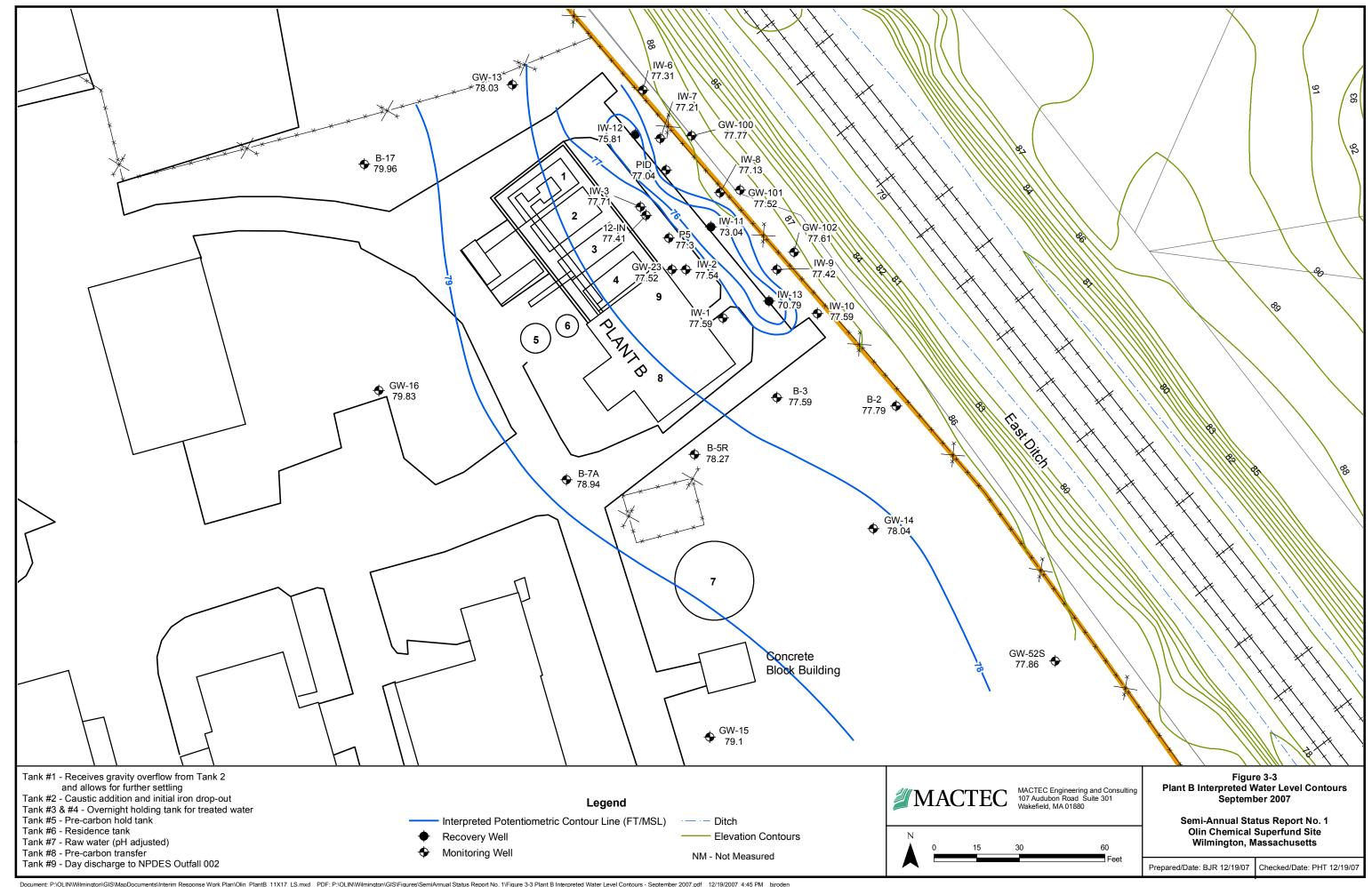


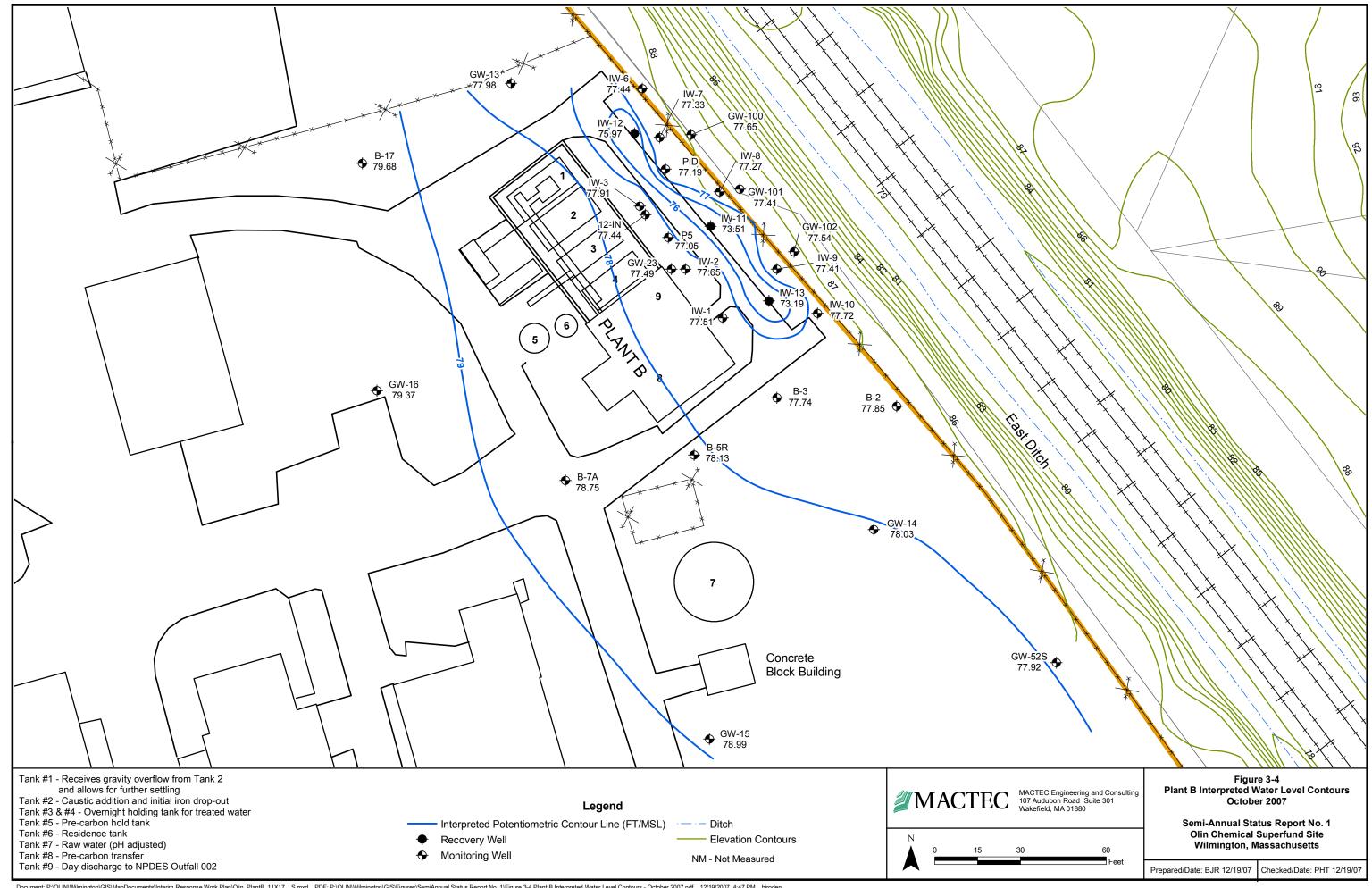


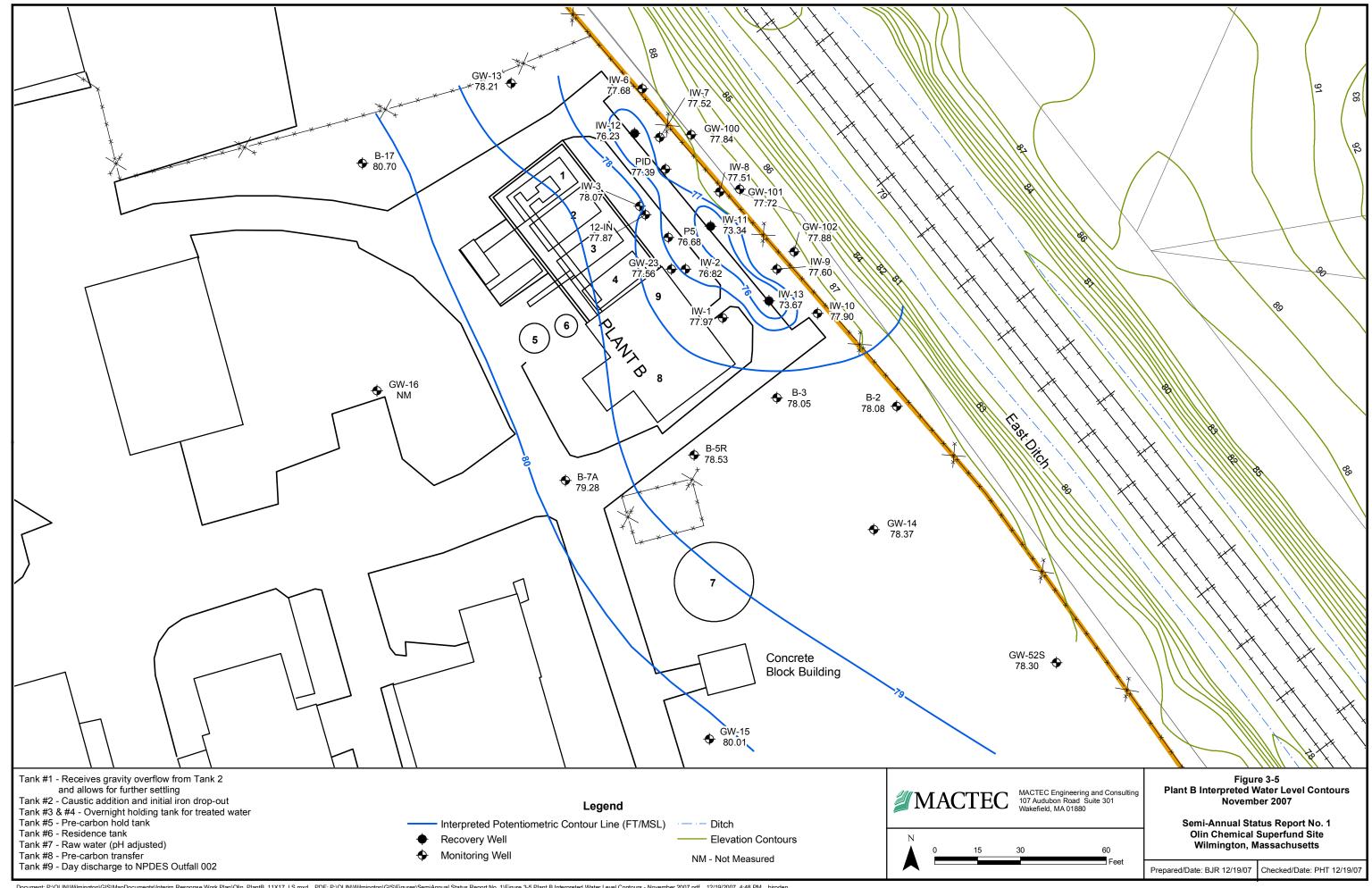


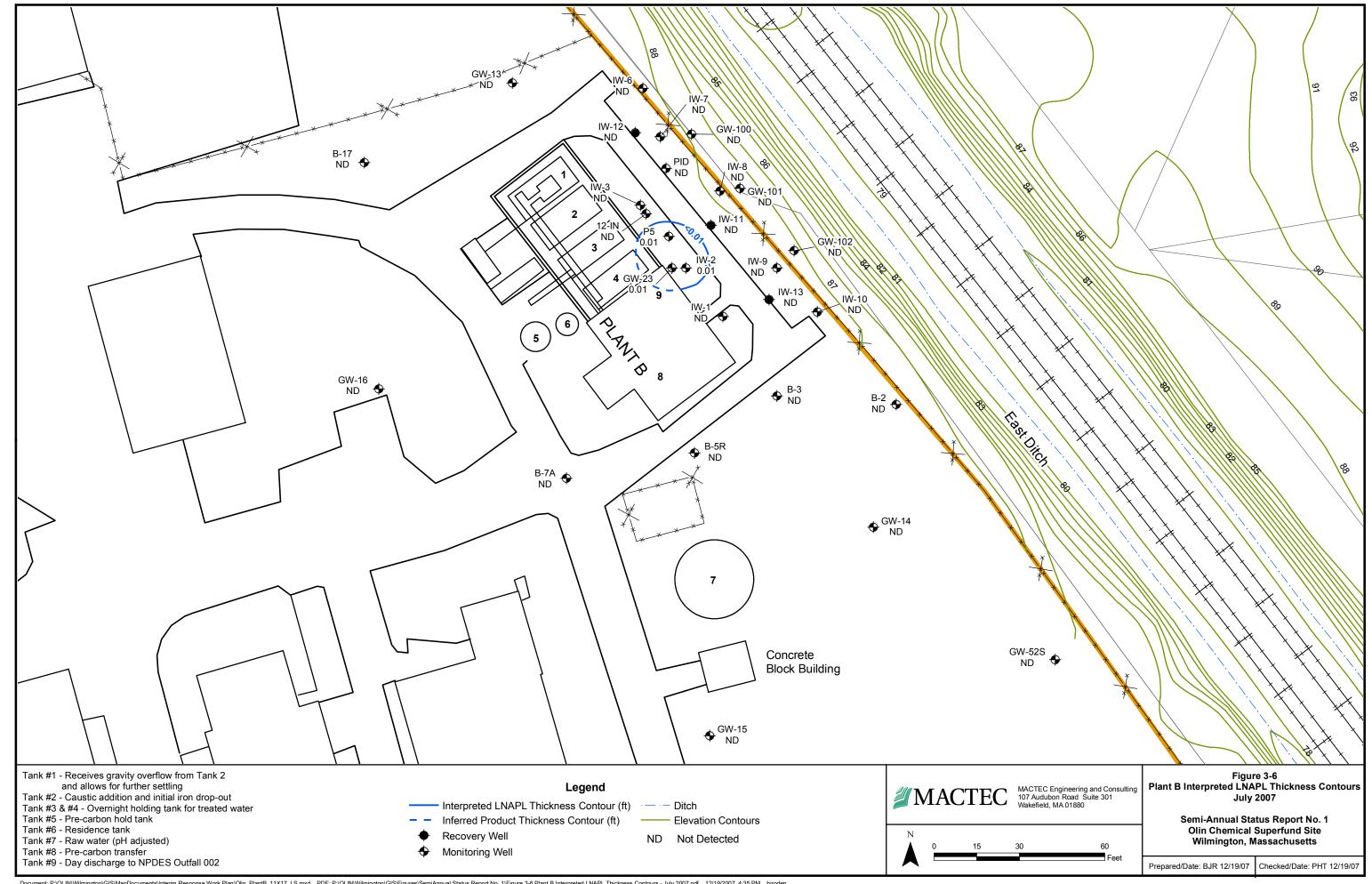


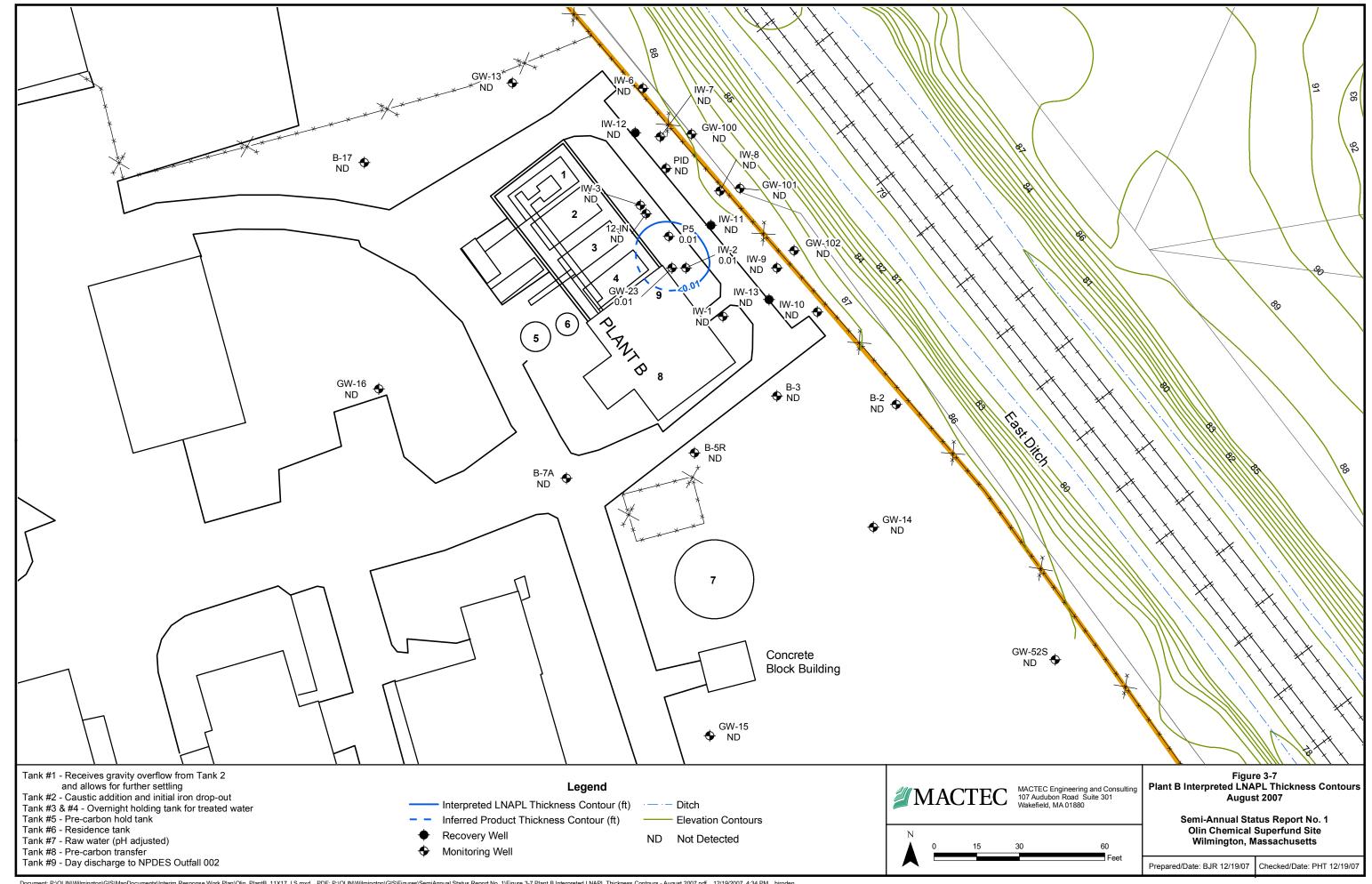


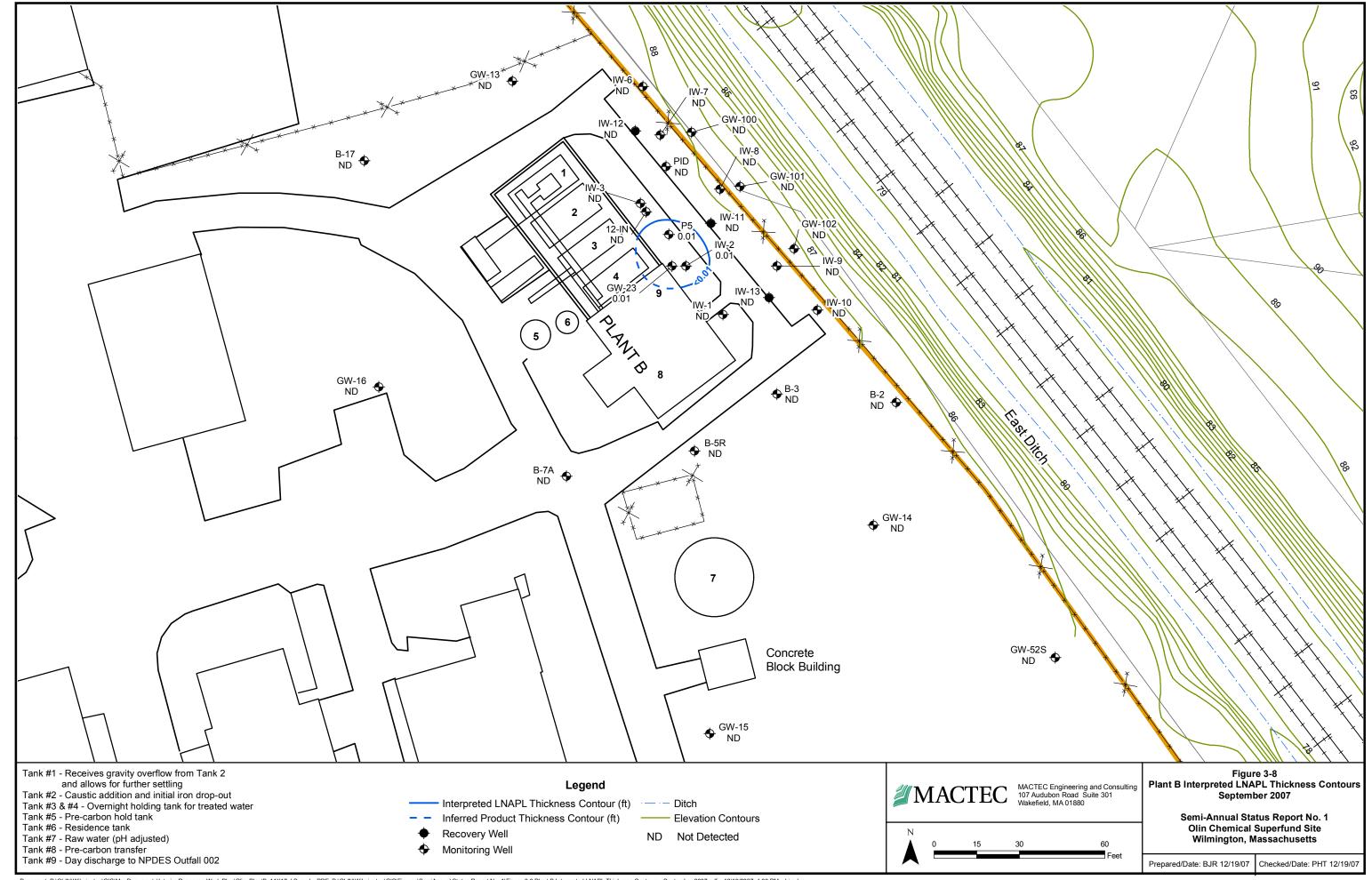


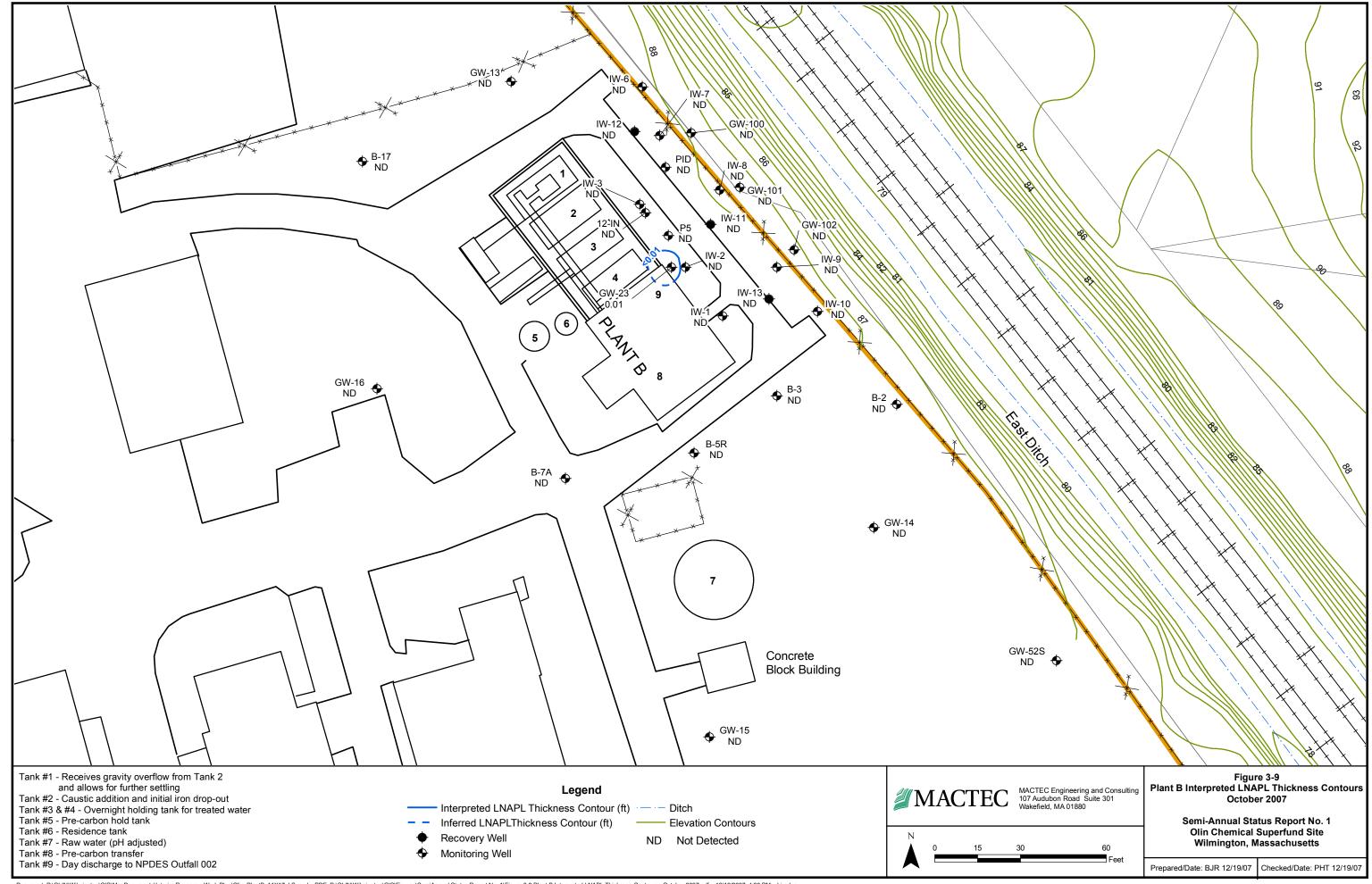


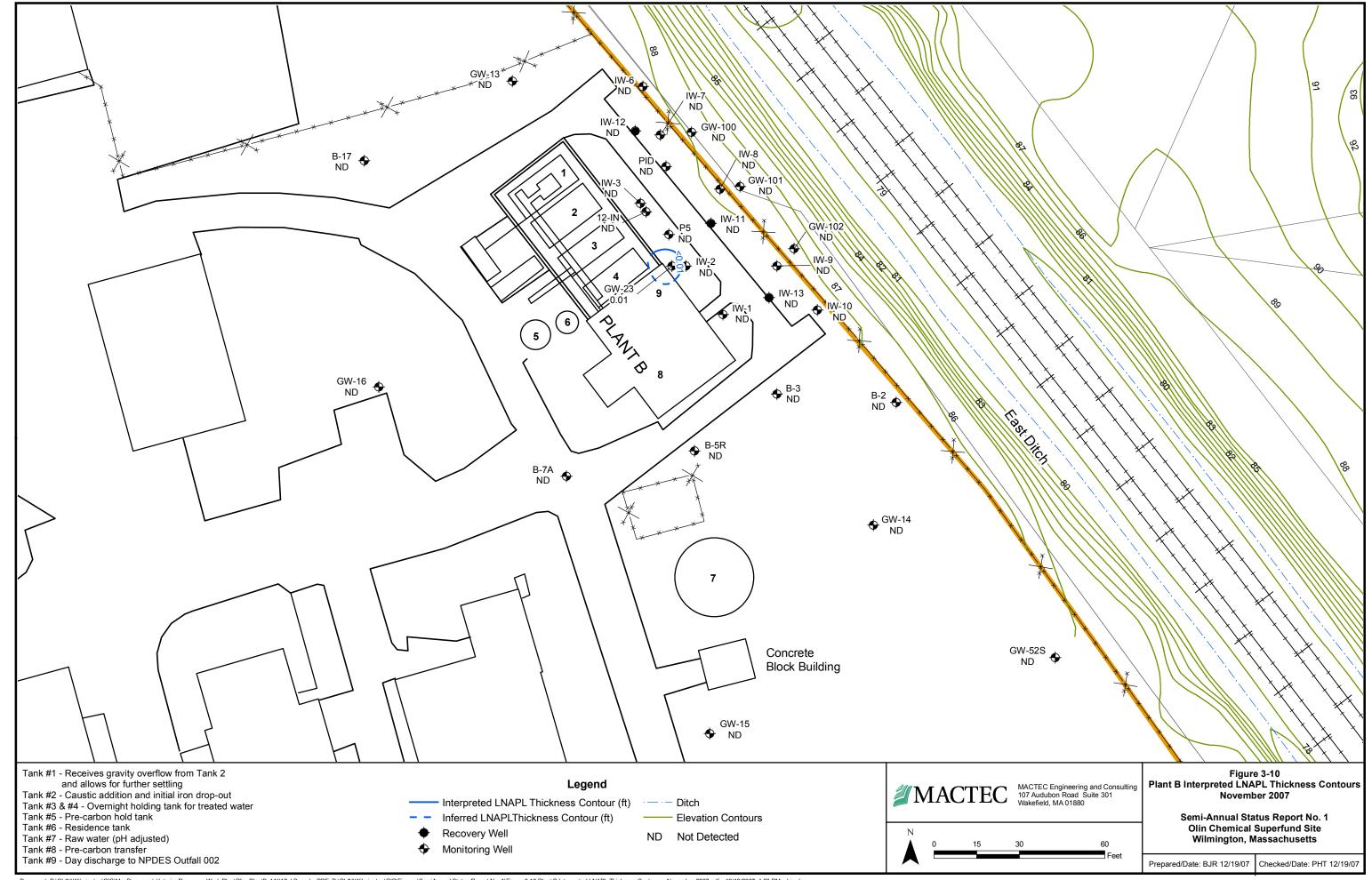












# **APPENDIX A**

# **Interim Response Steps Field Activity Reports**

- A-1 Third Quarter 2007 Sampling Event A-2 Fourth Quarter 2007 Sampling Event

# **APPENDIX A**

# **Interim Response Steps Field Activity Reports**

A-1 Third Quarter 2007 Sampling Event

# INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT THIRD QUARTER 2007 SAMPLING EVENT OLIN CHEMICAL SUPERFUND SITE WILMINGTON, MASSACHUSETTS



# engineering and constructing a better tomorrow

December 19, 2007

Mr. Steve Morrow, P.E. Olin Corporation 1186 Lower River Road Charleston, TN 37310

Subject: Interim Response Steps Field Activity Report

Third Quarter 2007 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

MACTEC Project No. 6300060010-81.17

Dear Mr. Morrow:

MACTEC Engineering and Consulting, Inc. (MACTEC) is pleased to submit the Interim Response Steps Field Activity Report for the third quarter 2007 sampling event.

Sincerely,

MACTEC Engineering and Consulting, Inc.

Peter H. Thompson

Project Manager
With permission

Michael J. Murphy

Senior Principal Scientist

### INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT THIRD QUARTER 2007 SAMPLING EVENT **OLIN CHEMICAL SUPERFUND SITE** WILMINGTON, MASSACHUSETTS

Prepared for:

Olin Corporation Wilmington, Massachusetts

Prepared By:

MACTEC Engineering and Consulting, Inc. 107 Audubon Road, Building 2, Suite 301 Wakefield, Massachusetts

MACTEC PROJECT NO. 6300060010-81.17

December 19, 2007

Project Manager . with permission

For Michael J. Murphy Senior Principal Scientist with permission

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Interim Response Steps Field Activity Report, Third Quarter 2007 Sampling Event MACTEC Engineering and Consulting, Inc. Project No. 6300060010-81.17

### **GLOSSARY OF ACRONYMS**

DO Dissolved Oxygen

IRSWP Interim Response Steps Work Plan

MACTEC Engineering and Consulting, Inc.

MassDEP Massachusetts Department of Environmental Protection

MCP Massachusetts Contingency Plan

MS/MSD Matrix Spike and Matrix Spike Duplicate

ORP Oxidation/Reduction Potential

RAM Release Abatement Measure

SC Specific Conductivity

SOPs Standard Operating Procedures STL Severn Trent Laboratories

USEPA U.S. Environmental Protection Agency

UV ultraviolet

## 1.0 INTRODUCTION

This sampling summary report presents the field activities completed in association with the Third Quarter 2007 surface water and groundwater sampling event for the Slurry Wall/Cap Monitoring Program, the Cap Inspection, and the groundwater sampling for the Plant B Monitoring Program.

#### 2.0 SLURRY WALL/CAP MONITORING PROGRAM

The purpose of the Slurry Wall/Cap Monitoring Plan surface and groundwater sampling and analysis activities is to monitor the concentrations of selected surface water and groundwater constituents in portions of the South Ditch and in selected Site groundwater monitoring wells and to measure groundwater levels over a portion of the 51 Eames Street, Wilmington, MA Site.

Groundwater and surface water locations which were sampled and the monitoring wells where groundwater levels were measured during the Third Quarter 2007 event are shown in **Table 1** and **Figure 1**. The Third Quarter 2007 groundwater and surface water monitoring program included the sampling of groundwater from three groundwater monitoring wells and three piezometers, the collection of surface water samples from seven locations within the South Ditch and the gauging of 23 water levels in monitoring wells and piezometers. Surface water and groundwater sampling was proposed in the MACTEC Engineering and Consulting, Inc. (MACTEC) "Draft Interim Response Steps Work Plan" dated July 25, 2007. The Draft Interim Response Steps Work Plan (IRSWP) contained recommendations for continued monitoring "in accordance with the requirements of the most recent Massachusetts Department of Environmental Protection (MassDEP) approved monitoring program until U.S. Environmental Protection Agency (USEPA) approval of the IRSWP." This was accomplished during the Third Quarter 2007 Monitoring Program.

Three monitoring well and three piezometer locations were sampled using low stress/low flow groundwater sampling methods. During sampling activities the purged groundwater was continuously monitored with a Horiba U-22 water quality instrument for pH, specific conductivity (SC), dissolved oxygen (DO), oxidation/reduction potential (ORP), and temperature. Upon stabilization of these parameters, groundwater samples were collected for laboratory analysis. Groundwater samples were collected August 21, 2007. Synoptic water levels were collected on August 20, 2007 before discharge of treated water from Plant B to the South Ditch occurred. Surface water samples were collected on August 22 and August 23, 2007 for laboratory analysis.

#### 2.1 SCOPE OF WORK

Groundwater samples were collected from each monitoring well and piezometer for both field and laboratory analysis in accordance with the Standard Operating Procedures (SOPs) in Appendix A of the Draft IRSWP. Analytical methods utilized for laboratory testing of

Appendix A of the Draft IRSWP. Analytical methods utilized for laboratory testing of groundwater are shown in Table 2. Prior to collection of groundwater, all monitoring wells were purged in accordance with USEPA 1996 low stress (low flow) guidelines and field indicator parameter measurements were obtained using a Horiba U-22 instrument equipped with a flow-through cell. The stabilization criteria are included in Appendix A of the Draft IRSWP. Well purging was continued at each location until the field indicator parameters were stable and samples were subsequently collected. The final low flow purging field parameter information at stabilization is presented in Table 3. The field data records for the groundwater sampling are contained in Appendix A. Two Horiba U-22 groundwater monitoring instruments were calibrated each day using standard auto-calibration solution. No readings outside manufacturer supplied calibration ranges were noted in the daily case narrative. The field instrument calibration records are contained in Appendix A. In addition, a 0.45-micron pore diameter, inline Teflon™ filter was used to field filter samples collected for filtered metals. During the sampling activities flow rates were generally maintained at approximately 350 milliliters per minute. During the low-flow monitoring well purging, flow rates and groundwater indicator parameters were measured and recorded to monitor the stability of groundwater parameters.

Consistent with the previous monitoring activities, the purged groundwater from each monitoring well was collected in collapsible plastic containers and pursuant to the Massachusetts Contingency Plan (MCP) (310 CMR 40.0045), and returned to the monitoring well subsequent to sample collection.

A synoptic round of groundwater level measurement was performed from 23 monitoring well and piezometer locations prior to initiating sampling activities. The groundwater level measurements are summarized in Table 4. The monitoring well and piezometer locations are shown in **Figure 1**.

Groundwater and surface water samples were collected in properly preserved laboratory-supplied containers, field filtered if appropriate according to Appendix A of the Draft IRSWP, and placed on ice for delivery to TestAmerica (formerly Severn Trent Laboratories (STL)) under chain-of-custody. The samples were delivered to the TestAmerica Westfield, MA facility for chemical analyses. Copies of the chain-of-custody documents are provided in Appendix B.

Surface water samples were collected in laboratory supplied bottles. These samples were collected by submerging dedicated tubing attached to a peristaltic pump in the standing water approximately one (1) inch above the stream substrate, and then filling the appropriate laboratory supplied pre-preserved bottles. Peristaltic pumps were selected to reduce the entrapment of floating or suspended sediment in the sample, while providing positive pressure in order to filter samples for filtered metals. The sampling locations are shown on **Figure 1**. All samples were collected from downstream to upstream. Laboratory analytical methods used for surface water samples are shown in Table 5.

Field indicator parameters were recorded at each location prior to sampling using a Horiba U-22 instrument equipped with a flow-through cell. In addition, a 0.45-micron pore diameter, in-line Teflon<sup>TM</sup> filter was used to field filter all samples collected for filtered metal analysis. Final surface water sampling field parameters are included in Table 6.

Surface water measurements were obtained from seven locations within the South Ditch. Depth of surface water was measured in each location prior to sampling. The surface water depth measurements obtained during this event are summarized in Table 6.

#### 2.2 WELL RECONNAISSANCE

Site reconnaissance of the monitoring well locations in the Slurry Wall/Cap Monitoring Program was performed. Data loggers were deployed in five monitoring wells: GW-10S, GW-35S, GW-CA1, GW-76S and GW-78S.

#### 2.3 CAP INSPECTION

The Third Quarter 2007 Temporary Cap Inspection at the 51 Eames Street Site, was completed on August 28, 2007.

#### 2.3.1 Background

Following the installation of the subsurface Containment Wall (Slurry Wall), the Containment Area was temporarily capped with 6-mil reinforced polyethylene sheeting. Seams between sheets were overlapped at least 3 feet and held in place with rows of gravel-filled bags. In December 2000, the first capping sheet was installed over the south-central portion of the Containment Area, around the temporary Catch Basin. In April 2001, four additional sheets were installed and the

Temporary Cap was completed and covered the Containment Area. In June 2001, a gravel roadbed (approximately 15 feet wide) was installed over the eastern and southern perimeter of the Temporary Cap.

As presented in Status Report No. 2 Part 2 Construction-Related Release Abatement Measure (RAM) dated August 28, 2001, areas of the Temporary Cap had begun to show signs of degradation as of June 2001. The degradation observed was blistering and separation of the layers of the 2-ply material. At that time, the material remained intact and the performance of the Temporary Cap had not been significantly compromised. Olin subsequently proposed quarterly inspections to assess long-term stability of the Temporary Cap material.

Olin submitted the Part 2 Construction-Related RAM; Modification No. 11 to MassDEP on November 18, 2002, describing proposed modifications to the Temporary Cap. The modifications included: installation of an 8-mil layer of polyethylene material over the existing cap material, ballasting the new material with sandbags on a grid pattern to minimize potential wind uplift, and sewing seams between sheets with ultraviolet (UV) resistant thread to reduce potential leakage. The cap improvements were completed in April 2003.

#### 2.3.2 Inspection

On August 28, 2007, MACTEC field personnel performed a visual inspection of the Temporary Cap surface. Photographs taken during the inspection are presented as Appendix C. In general, the Temporary Cap appeared to be in good condition, with very few tears or perforations. The tears that were visible only penetrated to the second layer of the separated 2-ply cover. The Temporary Cap surface contained sediment and water deposited in low lying areas of the cap.

- Olin site personnel corrected cap tears documented during the July 2006 inspection. However, the patch material used does not appear to adhere well to the cap material and as a result many patches are curling at the edges and pulling away (Photos 2 and 5).
- The scrim reinforced polyethylene cover remains flexible and has remaining service life.
- Sewn seams utilizing UV -resistant thread were intact.
- Most of the UV-resistant sandbags show moderate to severe signs of degradation. Wild seeding of some degraded sandbags has resulted in vegetation outgrowths from underneath and surrounding the bags. Plant roots do not penetrate the underlying polyethylene sheet.
- The gravel ballast placed along the perimeter of the cap remains in place.
- Many of the pools of water supported rafts of vegetation, mainly grass which do not seem to affect the cap deleteriously (Photo 3).
- Well penetrations need attention (Photo 1).

• Several small holes have resulted in a "waterbed effect" where water is trapped between locally between the two layers of plastic sheeting (Photo 4).

#### 2.3.3 Future Recommendations

Overall, the Temporary Cap was observed to be in good condition. Resealing around well penetrations, patching the small tears located in the cap, and continuing to monitor the cap for future concerns is recommended.

An alternative repair tape should be used and MACTEC recommends that a manufacturer of this polyethelene material be consulted to determine options for repair material.

#### 2.3.4 Limitations

Our professional services for this project have been performed in accordance with generally accepted engineering practices. No warranty, expressed or implied, is made.

#### 3.0 PLANT B MONITORING PROGRAM

The purpose of the Plant B groundwater sampling and analysis program is to monitor the concentrations of selected groundwater constituents and to record groundwater levels.

The Third Quarter 2007 collection of synoptic water levels was conducted by Olin personnel on August 31, 2007. Groundwater sampling was conducted on August 21, 2007.

Groundwater from one monitoring well is sampled at the Plant B location during this quarterly event. During sampling activities the purged groundwater was continuously monitored with a Horiba U-22 water quality instrument for pH, SC, DO, ORP, and temperature. Upon stabilization of these parameters, groundwater samples were collected for laboratory analysis. Groundwater sampling was conducted on August 21, 2007. Synoptic water level measurements were completed by Olin personnel on August 31, 2007.

#### 3.1 SCOPE OF WORK

A groundwater sample, a duplicate, a matrix spike, and a matrix spike duplicate sample were collected from GW-16 for both field and laboratory analysis in accordance with the SOPs in Appendix A of the Draft IRSWP. Analytical methods used for laboratory testing of groundwater sample are shown in Table 7. Prior to collection of groundwater, the monitoring well was purged in accordance with USEPA 1996 low stress (low flow) guidelines and the following field indicator parameter measurements were obtained: pH, SC, temperature, DO and ORP. The field parameter data were collected using a Horiba U-22 instrument equipped with a flow-through cell. During the sampling activities, flow rates were generally maintained at approximately 350 milliliters per minute. During the low-flow purging, flow rates and groundwater indicator parameters were measured and recorded to monitor the stability of groundwater parameters. The stabilization criteria are included in Appendix A of the Draft IRSWP. Well purging was continued until the field indicator parameters were stable and samples were subsequently collected. Field instrumentation calibration records and field data records are contained in Appendix A. The final low-flow purging field parameter information at stabilization is presented in Table 8.

Consistent with the previous monitoring activities, the purged groundwater from each monitoring well was collected in collapsible plastic containers and pursuant to the Massachusetts Contingency Plan (MCP) (310 CMR 40.0045), returned to the monitoring well subsequent to sample collection.

Groundwater levels were measured o the nearest 0.01 ft. by Olin personnel in each well location using an electronic water-level indicator. Groundwater measurements were obtained from all 28 proposed monitoring and extraction well locations and one staff gauge location. The groundwater levels obtained during this sampling event are summarized in Table 9. The monitoring well locations are shown in **Figure 2**.

Groundwater samples were collected in properly preserved laboratory-supplied containers, and placed on ice for delivery to the TestAmerica courier under chain-of-custody. The samples were delivered to the TestAmerica Westfield, MA facility for chemical analyses. Copies of the chain-of-custody documents are provided in Appendix B.

#### 3.2 WELL RECONNAISSANCE

Reconnaissance of the 28 wells and 1 staff gauge location in the Plant B program was performed. No maintenance activities were necessary.

Interim Response Steps Field Activity Report, Third Quarter 2007 Sampling Event MACTEC Engineering and Consulting, Inc. Project No. 6300060010-81.17

# **TABLES**

Table 1
Groundwater and Surface Water Sampling Locations
Slurry Wall/Cap Monitoring Program
Third Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Ground Water	Surface Water
GW-25	ISCO1
GW-79S	ISCO2
GW-202S	ISCO3
PZ-16RR	PZ-16RR
PZ-17RR	PZ-17RR
PZ-18R	PZ-18R
	SD-17

**Bolded** locations - samples were also collected for field duplicates and MS/MSD.

Table 2
Groundwater Analytical Program
Slurry Wall/Cap Monitoring Program
Third Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	LAC 107-06-1B	0.01	mg/l
Chloride	EPA 300.0	1	mg/l
Specific Conductivity	SM18 2510B	NA	umhos/cm
Sulfate	EPA 300.0	1	mg/l
Filtered Metals			
Aluminum, filtered	SW846 6010B	100	μg/l
Chromium, filtered	SW846 6010B	10	μg/l

Notes:

NA - not applicable mg/L - milligrams per liter µmhos/cm - micromhos per centimeter µg/L - micrograms per liter

# Table 3 Final Field Parameters for Groundwater Sampling Slurry Wall/Cap Monitoring Program Third Quarter 2007 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Monitoring Well Samples							
Location	GW-25	GW-79S	GW-202S				
Date	8/21/2007	8/21/2007	8/21/2007				
Depth to Water (ft)	5.91	4.56	7.10				
pH (standard units)	6.78	6.33	6.38				
Conductivity (µmhos/cm)	1,120	2,020	1,930				
Dissolved oxygen (mg/L)	0.00	0.81	0.88				
Temperature (°Celcius)	13.10	15.10	15.5				
Redox (millivolts)	-148	-212	60				
Piezometer Samples							
Location	PZ-16RR	PZ-17RR	PZ-18R				
Date	8/21/2007	8/21/2007	8/21/2007				
Depth to Water (ft)	3.58	2.68	2.48				
			2.22				
pH (standard units)	7.16	7.26	6.99				
0 1 (; : 1 - / / /	0.000	4.000	057				
Conductivity (µmhos/cm)	2,390	1,380	357				
Dissolved evergen (mg/L)	8.23	7.60	< 0.1				
Dissolved oxygen (mg/L)	8.23	7.60	< 0.1				
Tomporatura (%Coloius)	17.1	18.2	18.9				
Temperature (°Celcius)	17.1	10.2	10.8				
Redox (millivolts)	-180	-138	-209				
Redux (IIIIIIIVOIIS)	-100	-130	-203				

Notes:

ft - feet

µmhos/cm - micromhos per centimeter

mg/L - milligram per liter

Table 4
Synoptic Groundwater Elevations
Slurry Wall/Cap Monitoring Program
Third Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL/ SG- ID	Reference Elevation	Notes	Depth To Water	Corrected Elevation	Measured Date
I.D.	(ft msl)				
GW-10S	89.10		9.39	79.71	8/20/2007
GW-24	83.43		3.44	79.99	8/21/2007
GW-25	85.97		5.97	80.00	8/20/2007
GW-26	84.93		4.61	80.32	8/20/2007
GW-34D	90.38		8.11	82.27	8/20/2007
GW-34SR	89.13		9.35	79.78	8/20/2007
GW-35S	88.51		8.23	80.28	8/20/2007
GW-39	83.64		5.02	78.62	8/20/2007
GW-42S	84.18		4.05	80.13	8/20/2007
GW-55S	81.70		4.33	77.37	8/20/2007
GW-55D	81.95		4.68	77.27	8/20/2007
GW-76S	88.45	TOC	8.10	80.35	8/20/2007
GW-78S	84.89		5.07	79.82	8/20/2007
GW-79S	81.54		4.65	76.89	8/20/2007
GW-201S	83.29		5.90	77.39	8/20/2007
GW-202S	86.97		7.13	79.84	8/20/2007
GW-202D	86.52		6.59	79.93	8/20/2007
GW-CA1	88.01		7.65	80.36	8/20/2007
PZ-16RR/IN	79.07		3.81	75.26	8/20/2007
PZ-17RR/IN	79.50		2.81	76.69	8/20/2007
PZ-18R/IN	82.42		2.59	79.83	8/20/2007
PZ-24	89.43		8.04	81.39	8/20/2007
PZ-25	88.90		7.44	81.46	8/21/2007

#### Notes:

TOC - Water level measurement taken from Top of Casing, not Top of Riser. **Bold Text** indicates location sampled during current Quarterly event.

Prepared by: DLC Checked by: KJC

Table 5
Surface Water Analytical Program
Slurry Wall/Cap Monitoring Program
Third Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	LAC 10-107-06-1B	0.10	mg/l
Nitrate	EPA 300.0 Part A	0.05	mg/l
Nitrite	EPA 300.0 Part A	0.10	mg/l
Chloride	EPA 300.0 Part A	10	mg/l
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0 Part A	2.0	mg/l
Total Metals			
Aluminum, Total	SW846 6010B	100	μg/l
Chromium, Total	SW846 6010B	5.0	μg/l
Sodium, Total	SW846 6010B	2000	μg/l
Filtered Metals			
Aluminum, Filtered	SW846 6010B	100	μg/l
Chromium, Filtered	SW846 6010B	5.0	μg/l
Sodium, Filtered	SW846 6010B	2000	μg/l

Notes:

mg/L - milligrams per liter

µmhos/cm - micromhos per centimeter

μg/L - micrograms per liter

# Table 6 Final Field Parameters for Surface Water Sampling Slurry Wall/Cap Monitoring Program Third Quarter 2007 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Surface Water Samples							
Location	ISCO1	PZ-16RR	PZ-17RR	SD-17	PZ-18R	ISCO2	ISCO3
Date	8/22/2007	8/22/2007	8/22/2007	8/22/2007	8/22/2007	8/22/2007	8/22/2007
Depth of Water (ft)	0.7	0.3	0.5	0.3	0.8	0.5	0.7
pH (standard units)	6.72	6.67	5.92	6.29	6.47	6.00	5.56
Conductivity (µmhos/cm)	401	2810	2040	1920	547	1650	534
Dissolved oxygen (mg/L)	8.07	10.50	7.30	7.60	3.5	4.45	11.35
Temperature (°Celcius)	17.6	10.48	16.0	17.8	17.4	13.5	14.2
Redox (millivolts)	5.0	-40	-117	-59	-29	-64	-16

Notes:

ft - feet

µmhos/cm - micromhos per centimeter

mg/L - milligram per liter

Checked by: BJR

Prepared by: KJC

Table 7
Groundwater Analytical Program
Plant B Monitoring Program
Third Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Volatile organic compounds (VOC)			
2,4,4, Trimethyl-1-pentene	SW846-8260B	1.0	μg/l
2,4,4, Trimethyl-2-pentene	SW846-8260B	1.0	μg/l
Semivolatile organic compounds (SVOC)			
N-nitrosodiphenylamine	SW846-8270C	5.2	μg/l
bis(2-ethylhexyl)phthalate	SW846-8270C	5.2	μg/l
Volatile Petroleum Hydrocarbons (VPH)			
C5-C8 Aliphatics	MA VPH	100	μg/l
C9-C12 Aliphatics	MA VPH	100	μg/l
C9-C10 Aromatics	MA VPH	100	μg/l
Methyl-tert-butyl-ether (MTBE)	MA VPH	5.0	μg/l
Benzene	MA VPH	5.0	μg/l
Ethylbenzene	MA VPH	5.0	μg/l
m,p-Xylene	MA VPH	10	μg/l
o-Xylene	MA VPH	5.0	μg/l
Naphthalene	MA VPH	10	μg/l
Physical/Inorganic Parameters			
Ammonia-Nitrogen	LAC 107-06-1	0.10	mg/l
рН	SM18 4500 H+ B	0.10	SU
Filtered Metals			
Iron, Filtered	SW846 6010B	100	μg/l

Prepared by: KJC

Checked by: BJR

Notes:  $\mu g/L$  - micrograms per liter

mg/L - milligrams per liter

SU - standard units

# Table 8 Final Field Parameters for Groundwater Sampling Plant B Monitoring Program Third Quarter 2007 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Monitoring Well Samples						
Location	GW-16					
Date	8/21/2007					
Depth to Water (feet)	11.89					
pH (standard units)	5.29					
Conductivity (µmhos/cm)	1,180					
Dissolved oxygen (mg/L)	2.56					
Temperature (°Celcius)	18.0					
Redox (millivolts)	113					

#### Notes:

ft - feet µmhos/cm - micromhos per centimeter mg/L - milligram per liter

Table 9
Synoptic Groundwater Elevations
Plant B Monitoring Program
Third Quarter 2007 Sampling Event <sup>1</sup>
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL/ SG- ID	Reference Elevation <sup>2</sup>	Notes	Depth To Water	Depth To Product	Corrected Elevation	Measured Date
I.D.	(ft msl)					
B-2	90.48		12.77	NPD	77.71	8/31/2007
B-3	90.32		12.72	NPD	77.60	8/31/2007
B-5R	91.38		13.27	NPD	78.11	8/31/2007
B-7A	88.81		9.92	NPD	78.89	8/31/2007
B-17	91.55		11.88	NPD	79.67	8/31/2007
GW-13⁴	90.57		12.75	NPD	77.82	8/31/2007
GW-14	88.7		10.72	NPD	77.98	8/31/2007
GW-15⁴	90.01		10.98	NPD	79.03	8/31/2007
GW-16 <sup>4</sup>	91.21		11.62	NPD	79.59	8/31/2007
GW-23	91.04		13.65	13.65	77.40	8/31/2007
GW-52S⁴	87.95		10.10	NPD	77.85	8/31/2007
GW-100	90.15		12.64	NPD	77.51	8/31/2007
GW-101	90.14		12.85	NPD	77.29	8/31/2007
GW-102	89		11.54	NPD	77.46	8/31/2007
IW-1	90.71		13.24	NPD	77.47	8/31/2007
IW-2	90.53		13.20	13.20	77.34	8/31/2007
IW-3	90.76		13.18	NPD	77.58	8/31/2007
IW-6	89.15		11.86	NPD	77.29	8/31/2007
IW-7 <sup>4</sup>	90.1		12.94	NPD	77.16	8/31/2007
IW-8 <sup>4</sup>	89.94		12.87	NPD	77.07	8/31/2007
IW-9 <sup>4</sup>	89.78		12.57	NPD	77.21	8/31/2007
IW-10 <sup>4</sup>	90.43		12.91	NPD	77.52	8/31/2007
IW-11	89.92		17.18	NPD	72.74	8/31/2007
IW-12	90.31		14.56	NPD	75.75	8/31/2007
IW-13	89.9		19.15	NPD	70.75	8/31/2007
PID	89.97		12.98	NPD	76.99	8/31/2007
P5	90.45		13.22	13.22	77.24	8/31/2007
12-IN	89.84		12.50	NPD	77.34	8/31/2007
SG	79.25		NM	NPD	NM	8/31/2007

Notes:

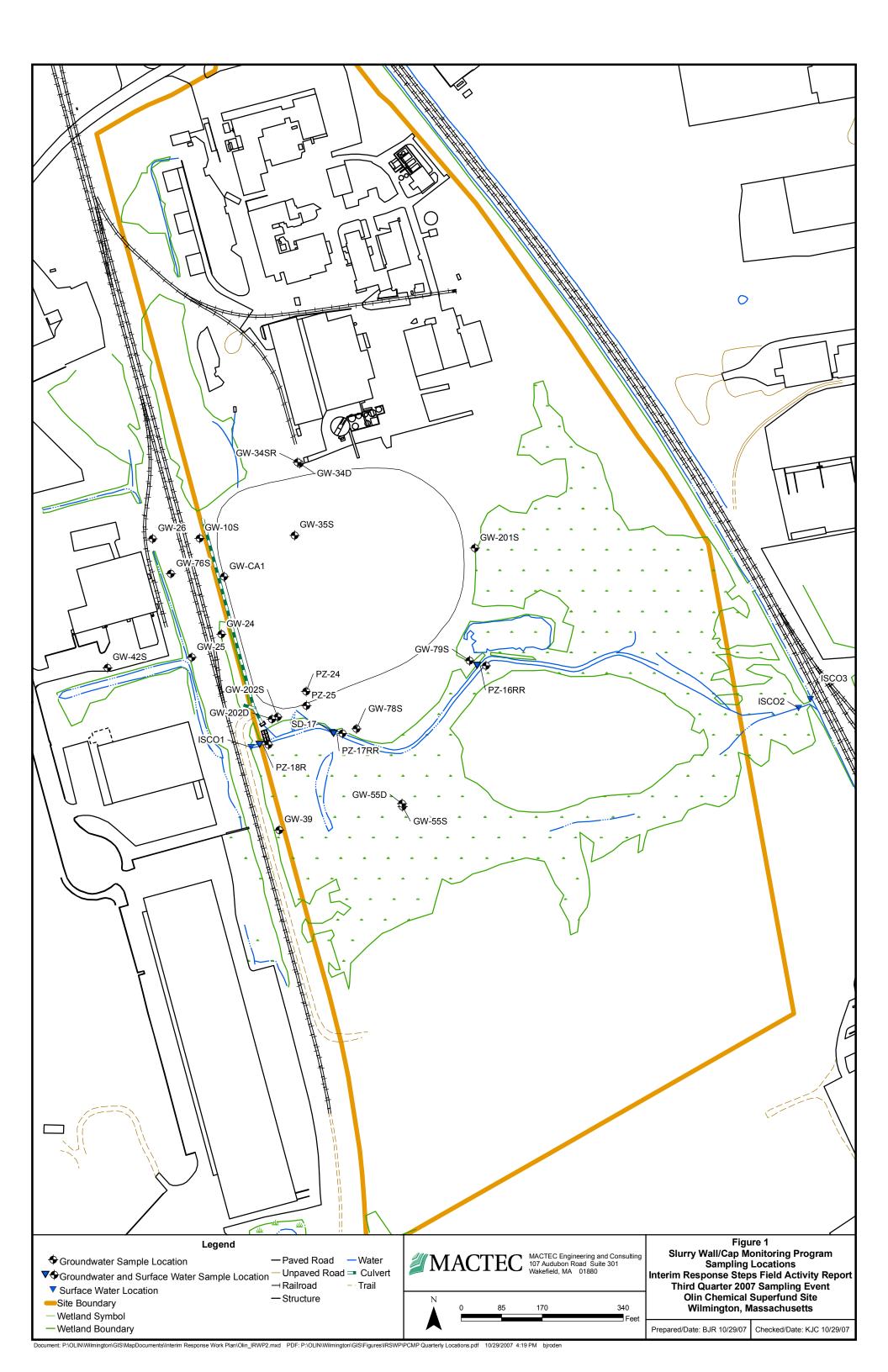
Prepared by: KJC Checked by: BJR

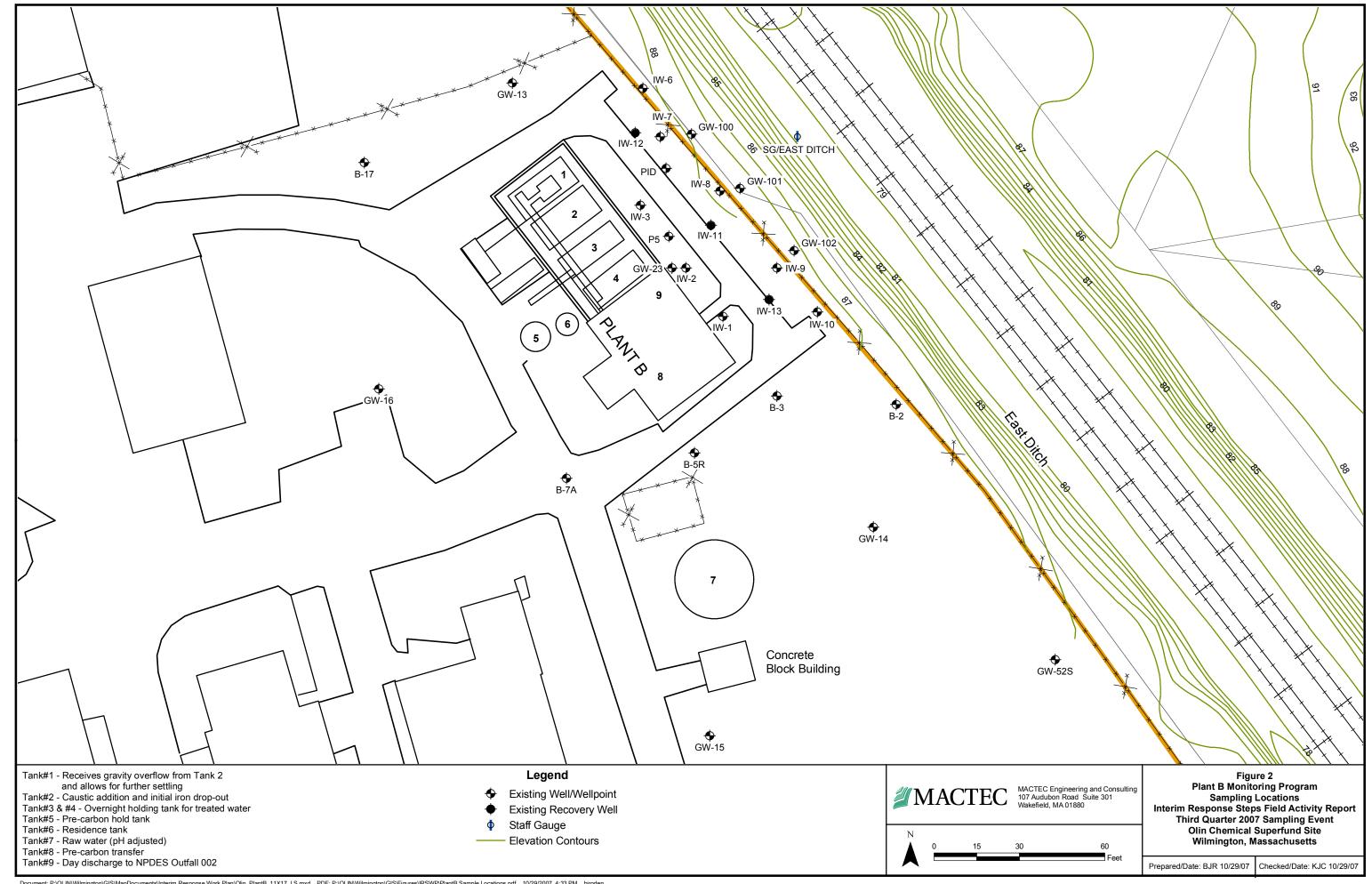
NM - Not Measured NPD - No Product Detected

- [1] Ground water and product elevation data collected by Olin.
- [2] Measurement collected from top of PVC. If well does not have PVC casing, measurement from top of steel casing.
- [3] Correction equation used: Reference Elevation - (depth to water - (product thickness X 0.95))
- [4] New top of casing reference elevations surveyed by Dana Perkins 4/98-5/98. Other wells resurveyed 11/97 following upgrades and repairs.

Interim Response Steps Field Activity Report, Third Quarter 2007 Sampling Event MACTEC Engineering and Consulting, Inc. Project No. 6300060010-81.17

# **FIGURES**





### **APPENDIX A**

# Field Data Records and Field Instrument Calibration Records

FIELD INSTRUMENTATION CALIBRATION RECO	RD MACTEC Engineering and Consulting
PROJECT Olin Wilmington	DATE 8121)073
CREW ID OR TASK ID	JOB NUMBER 63000010
SAMPLER SIGNATURE	
EQUIPMENT CALIBRATION CALIBRATION INFOR	RMATION ACCEPTANCE
STANDARD VALUE	METER VALUE CRITERIA **
HORIBA MODEL NO. U - ZZ pH	pH 4.00 units +/- 10% of standard
UNIT ID NO. MO15-11 Sp. Conductivity 4.49 mS/cm Sp. Condu	,
	Redox 158 mV see note 1
DOmg/L *	DO <b>9.63</b> mg/L +/- 10% of standard
Thermometer Temperaturedeg. C Tempe	erature 16 · 3 deg. C +/- 2.0 deg. C
TURBIDITY METER TYPE Hach Z1007 20.1 NTU (low)	
MODEL NO. ZIOCP	24.5 the standard
UNIT ID NO. MOZ4-18 NTU (high)	852 NTU +/- 10% of standard
PHOTOIONIZATION	
METER TYPE Backgroundppmv Zero Airppmv	v Meterppmv within 5 ppmv of Zero
MODEL NO Span Gasppmv	Meter ppmv +/- 10% of standard
UNIT ID NO	PRILL PRILL
OTHER METER TYPE	see note 2
MODEL NO	see note 2
UNIT ID NO	see note 2
	SPECIAL CONTRACTOR ACT
OTHER METER TYPE	see note 2
MODEL NO	see note 2
UNIT ID NO	see note 2
Communication of the Communica	alibration Fluids/
The transfer of the state of th	tandard Source:
	ot Numbers pH 5612 Ex- 2/19109
Sample Preservatives Source:	mV
Disposable Filter Type:	Sp. Cond.
Other	Turb.
NOTES:	
×.	
• = Indicate in notes section what was used as the DO standard (i.e., based on saturation at room temperat	cure)
** = If the meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a c	
necessitate use of the instrument, clearly document on all data sheets and log book entries that the spin a meter must read within specified range of the Zobell solution (usually 231 +/- 10 mv @ 25 deg C).	
2 = specify acceptance criteria in the Notes section	

FIELD INSTRUMENTATION CALIBRA	ATION RECORD	MACTEC Engineering and Consulting
PROJECT PLMP	DATE	8 21 07
CREW ID OR TASK ID	JOB NUMBER	6500 60010
SAMPLER SIGNATURE ALL		_
2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 - 2 -	CALIBRATION INFORMATION	ACCEPTANCE
HORIBA MODEL NO. V-22 PH 4.0	ALUE METER VAI	LUE CRITERIA ** units +/- 10% of standard
UNIT ID NO. MOIS-10 Sp. Conductivity 4.41	mS/cm Sp. Conductivity 4. 44	mS/cm +/- 10% of standard
Redox	mV Redox <u>/7</u>	mv see note 1
DO	mg/L * DO <u>9.47</u>	mg/L +/- 10% of standard
Thermometer Temperature 16.7	deg. C Temperature 14.7	deg. C +/- 2.0 deg. C
	0.1 NTU (low) 0.76	NTU within 0.3 NTU of
	20 21.4	the standard
LINUTID NO LAC - LAC	NTU (high) 115	NTU +/- 10% of standard
PHOTOIONIZATION		
	A STATE OF THE STA	ppmv within 5 ppmv of Zero
MODEL NO Span Gas	ppmv Meter	ppmv +/- 10% of standard
UNIT ID NO		
OTHER METER TYPE		see note 2
MODEL NO		see note 2
UNIT ID NO		see note 2
OTHER METER TYPE		see note 2
MODEL NO		see note 2
UNIT ID NO		see note 2
Control and the Control of the Contr	Lot Number Calibration Fluids/	2/14/08
Deionized Water Source:		JUTE COL PET 5612
Trip Blank Water Source:		
Sample Preservatives Source:		
Disposable Filter Type:	Sp. Cond Turb.	<del></del>
Other	Tulo.	
NOTES:		
*		
<i>©</i>		
* = Indicate in notes section what was used as the DO standard (i.e., based or  ** = If the meter reading is not within acceptance criteria, clean or replace prof		ble. If assign some some series
necessitate use of the instrument, clearly document on all data sheets an	d log book entries that the specified parameter was	
1 = meter must read within specified range of the Zobell solution (usually 231 2 = specify acceptance criteria in the Notes section	+/- 10 mv @ 25 deg C).	
2 - specify acceptance official in the Notes section		Victoria de la companya della companya della companya de la companya de la companya della compan

FIELD INSTRUMENTATION CALIBRATION RECORD MACTE	EC Engineering and Consulting
PROJECT AUGUST 2007 Overserly Shing round DATE 8	22 07
	0000000
SAMPLER SIGNATURE	
EQUIPMENT CALIBRATION CALIBRATION INFORMATION	ACCEPTANCE
STANDARD VALUE	s/cm +/- 10% of standard see note 1  //L +/- 10% of standard g. C +/- 2.0 deg. C  Within 0.3 NTU of the standard
PHOTOIONIZATION         METER TYPE	_ppmv within 5 ppmv of Zero _ppmv +/- 10% of standard
OTHER METER TYPE  MODEL NO UNIT ID NO	see note 2 see note 2 see note 2
OTHER METER TYPE  MODEL NO UNIT ID NO	see note 2 see note 2 see note 2
Trip Blank Water Source: Lot Numbers pH Sample Preservatives Source: mV Disposable Filter Type: Sp. Cond.	5612 exp 2/16/08
NOTES:  # 157 reading Am calibration  And reading Pm calibration clack	
* = Indicate in notes section what was used as the DO standard (i.e., based on saturation at room temperature)  ** = If the meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if available. If pro necessitate use of the instrument, clearly document on all data sheets and log book entries that the specified parameter was not calibrate meter must read within specified range of the Zobell solution (usually 231 +/- 10 mv @ 25 deg C).  2 = specify acceptance criteria in the Notes section	

FIELD D	ATA REC	ORD	- LOV	N FLOW	ROUN	DWAT	ER SAM	<b>IPLING</b>								
PROJECT	911	n .	W11	mind	ten s	AMPLE I.	D. NUMBER	: P :	2 - 18 2		]			ROL	IND NO.	
EXPLORATIO	ON ID: P	Z	- 18	R			SITE TYP	- 1			]			DATE [	812	1107
TIME S	START, 13:	55	END	14:4	5		JOB NUMBE	7 -	500060		]		FILE	TYPE [	_	-,
INITIAL DEP		H8	6		JREMENT F DP OF WEL DP OF PRO THER	L RISER	CASING	PROTECTIN CASING ST (FROM GRO	ICKUP	FI	]	DIFFER	WELL			FT
FINAL DEPT	TH 2	20		FT WELL (TOR)	L	6.10	FT FT	PID AMBIENT A	IR	ຼ PPM	1	WELL DIAMET WELL	rer [	1	ES N	IN O N/A
DRAWDOW VOLUM (initial - fir TOTAL VO PURGE	VN ME inal x 0.16 (2-inch	2	<b>3</b> ( .65 (4-inct	LENGI GAL RATION TO	O OF DRAW TOTAL VOI	UME PUF	RGED	PRESSURE TO PUMP REFILL TIMER SETTING	.P//	A PS	]	DISCHATIMER SETTIN	CASI LOCK COLL	NG ED AR	×   A	
TIME	TA DEPTH TO WATER (ft)		IRGE E (ml/m)	TEMP. (deg. c)	CONDU	CIFIC CTANCE /cm)	pH (units)	DISS. 02 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	DEF	UMP TAKE PTH (ft)		СОММЕ	NTS	
14:03	•	)	,	19.0	0.3			40.1	10.2	-215		//2				
14:06		1		18.9	0.3	67	7.01	20.1	7.51	-213					- Wanted	
14:09		+		18.9	0.3			20.1	5.32	-211	$\sqcup$					
14:12		+		18.9	0.3		6.99		5.26	- 210	$\dashv$	-			-	
14:2	<i>-</i> 5	-	pic		0.3	AVI .	6.99	20.1	-1.43		$\forall$					
			1			<u> </u>										
	y.º	t						i de la companya de l			4					
TYPE OF	D BLADDER ICO BLADDER	ATION		TYPE OF TUBI	R TEFLON			PE OF PUMP POLYVINY STAINLESS OTHER	L CHLORIDE		TYP	E OF BL TEFLO OTHER		MATERIA	<u>L</u>	
San Security and Security	AL PARAMETE	RS			1700 to 1000 to				SHEAT CHEET CAN							
To Be Collected  VOC SVO SVO PES TAL CYA Main TOC TSS TKN Cothe	C-ON-SITE LAB COC ST/PCBs INORGANICS ANIDE DRO COC STORY	5 Y	SP.	Min	.Р	- -		RESERVATION METHOD HCL / 4 DEC 4 DEG. C 4 DEG. C HN03 to pH HCL / 4 DEC HCS / 4 DEG. C	3. C 2 X 40 r 2 X 1 L 2 X 1 L 2 X 1 L 1 X 2 X 1 L 1 X 2 X 1 L 1 X 2 X 40 r 1 X 1 L 2 X 1 L 2 X 40 r 1 X 1 L 2 X 1 L 2 X 1 L 2 X 40 r 1 X 1 L 2	RED mL AG AG AG P AG ML AG		VOI SVO PES TAL	C- ON-SIT C OC ST / PCBs - INORGA ANIDE ne DRO C	ı		
PURGE WAT CONTAINER NOTES All Equipme		No	d or deco	22	ALLONS _			LOCATION	N SKETCH							
SIGNATURE		22		M	_								į		MACI	ГЕС

FIELD DATA RECORD - LOW FLOW	GROUNDWATER SAME	PLING	
PROJECT OWN	SAMPLE I.D. NUMBER	PZ - 17 ER	ROUND NO.
EXPLORATION ID: PZ-17 PR	SITE TYPE	Superfund	DATE 8/2110
TIME START 11:50 END 12:4	JOB NUMBER	6300060010	FILE TYPE -
INITIAL DEPTH	TOP OF PROTECTIVE CASING C	PROTECTIVE CASING STICKUP FROM GROUND) FT	PROTECTIVE CASING / WELL DIFFERENCE FT
FINAL DEPTH E SS	R) G. OF FT A	MBIENT AIR PPM	WELL 1. IN
DRAWDOWN VOLUME O.14 GAL RA	TIO OF DRAWDOWN VOLUME PO TOTAL VOLUME PURGED TO TOTAL VOLUME PURGED	PRESSURE CO PUMP PSI  REFILL RIMER PSI  RIMER PSI  REFILL RIMER PSI  RIMER	WELL YES NO N/A INTEGRITY: CAP CASING LOCKED COLLAR  DISCHARGE TIMER SETTING
PURGE DATA    DEPTH TO	1.32 7.19	DISS. 02 TURBIDITY REDOX (mg/L) (ntu) (mv)  0.41 75.7 -165  3.69 62.6 -160  1.70 40.5 -153	PUMP INTAKE DEPTH (ft) COMMENTS
12:12 18.2		7.79 30.2 -147	
12:15		1.72 13.6 -139	
12:16	S77.81	7.60 13.7 -138	
12:25 Sample calle	creel		
SIMCO BLADDER  GEOPUMP  OTHER  ANALYTICAL PARAMETERS To Be Collected  VOC- ON-SITE LAB  VOC  SVOC  PEST / PCBs  TAL INORGANICS  CYANIDE  Maine DRO  TOC  TSS  TKN  Other American La Cas N	METHOD PRE  METHOD PRE  MUMBER  MOD-8021 H  8260B H  CLP 4  CLP 4  CLP 4  CLP 4  CLP H  335.4  MEDEP H  USEPA 415.1 H  USEPA 160.2 4  USEPA 351.2 H	POLYVINYL CHLORIDE STAINLESS STEEL DTHER ESERVATION VOLUME	TYPE OF BLADDER MATERIAL  TEFLON  OTHER  SAMPLE COLLECTED  VOC- ON-SITE LAB  VOC SVOC PEST / PCBS TAL INORGANICS CYANIDE Maine DRO TOC TSS TKN
PURGE OBSERVATIONS  PURGE WATER NUMBER OF CONTAINERIZED YES NO GENERATED  NOTES  All Equipment used either dedicated or deconned prior to arrival on site. No rinseate/ field blank required	GALLONS	OCATION SKETCH	ē ā
SIGNATURE:	K		MACTEC

POST   PC   PC   PC   PC   PC   PC   PC   P	FIELD DATA RECORD - LO	OW FLOW GROUN	DWATER SAM	PLING		19.	2			
DATE   STATE   TOPS   BID   10 a   DATE   STATE   TOPS   BID   10 a   DATE   STATE   TOPS   BID   11 a   DATE   STATE   TOPS   BID   BID   TOPS   BID   TOPS   BID   BID   BID   TOPS   BID	PROJECT PIMP OLIA	1 Vilmingson - s	AMPLE I.D. NUMBER	0	82107			F	ROUND NO.	
MATER LEVEL   FUMP SETTINGS			SITE TYPE	5.1	er fund			DATE	8 21 07	
WATER LEVEL   PUMP SETTINGS	TIME START 1008	END ILOG	JOB NUMBE			10		FILE TYPE		
NUTAL DEPTH	WATER LEVEL / PUMP SETTINGS	TOP OF WELL	L RISER TECTIVE CASING	PROTECTIVE	E CKUP 2		CASING	/MELL [	0.17	
TO WATER	TO WATER 4,56	FT WELL DEPTH		PID			WELL		7.	
NOTES   NOTE	TO WATER 4.61					- PPM			YES NO N/A	
The composition   The compos	VOLUME , O 0 7 (initial - final x 0.16 (2-inch) or x 0.65 (4-	inch)) TO TOTAL VOI	UME PURGED	TO PUMP		PSI		COLLAR	差三三	
DEPTH TO   PURCE   TEMP   (dog of (includen)   (dust)   (mode)	PURGED 2.905	GAL		TIMER			TIMER	ADAMS V		
10   15   1   19   15   1   19   10   15   1   19   10   15   1   19   15   1   19   10   15   1   19   10   15   1   19   10   10   10   10   10   10	DEPTH TO PURGE TIME WATER (ft) RATE (ml/m	TEMP. CONDU	CTANCE pH /cm) (units)	(mg/L)	(ntu)		INTAKE			
15.1								Sultur.	Smell	
15.0	10/3					N - 20 - 100 - 1				-
15.0   1.99   3.3   0.58   1.91   -Jug   1.93   1				-				( - "		-
10 373						Description of the last of the				1
15.0   15.0										-
EQUIPMENT DOCUMENTATION TYPE OF PUMP MATERIAL TYPE OF BLADDER MATERIAL TYPE OF PUMP MATERIAL TYPE OF BLADDER THEN DATE MATERIAL TYPE OF BLADDER MATERIAL TYPE OF BLADDER THEN DATE MATERIAL TYPE OF BLADDER MATERIAL TYPE OF BLADDER THEN DATE MATERIAL TYPE OF BLADDER MATERIAL TYPE OF BLADDER THEN DATE MATERIAL TYPE OF BLADDER THEN DATE MATERIAL TYPE OF BLADDER THEN DATE MATERIAL TYPE OF BLADDER MATERIAL TYPE OF BLADDER THEN DATE MATERIAL TYPE OF B			100		200	A COUNTY OF THE PARTY OF THE PA		Murch	Horiba Te clair	1470 (
EQUIPMENT DOCUMENTATION TYPE OF PUMP MATERIAL TYPE OF PUM		1/4837	36 V/ 1 Test						28 1- 210-0	
TYPE OF PUMP  TYPE OF TURNS  TYPE OF PUMP MATERIAL  TYPE OF RIADDER MATERIAL  TYPE OF RIADDER MATERIAL  TYPE OF RIADDER MATERIAL  TO BE OF PUMP MATERIAL  TO POLYVINYL CHLORIDE  TEFLON  TEFLON  TEFLON  TO THER  SAMPLE  COLLECTED  COLLECTED  TO COLLECT		1.1								
METHOD   PRESERVATION VOLUME   SAMPLE	TYPE OF PUMP QED BLADDER SIMCO BLADDER	TEFLON OR TEFLON	LINED	POLYVINYL STAINLESS	CHLORIDE		TEFLO	N	FRIAL	
VOC- ON-SITE LAB	ANALYTICAL PARAMETERS				N VOLL	IME	SAMPLE	4		1
SVOC PEST / PCBs CLP 4 DEG. C 2 X 1 L AG PEST / PCBs TAL INORGANICS CLP HN03 to pH <2 1 x 1 L P TAL INORGANICS CYANIDE 335.4 Maine DRO MEDEP HCL / 4 DEG. C 2 X 1 L AG Maine DRO TOC USEPA 415.1 USEPA 415.1 USEPA 160.2 USEPA 351.2 USEPA 351.2 USEPA 351.2 USEPA 351.2 FOther All Contained from the first contained prior to arrival on site. No rinseate/ field blank required  A DEG. C 2 X 1 L AG PEST / PCBs PATL INORGANICS CYANIDE CYANIDE HN03 to pH <2 1 x 1 L P TAL INORGANICS CYANIDE HAVE C 2 X 4 D ML TOC TOC USEPA 415.1 H2SO4 to pH <2 1 X 1 L P TKN POther All Contained from the field blank required  LOCATION SKETCH	VOC- ON-SITE LAB			50 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	A 700 A 700 PM	-	Secretary and the second	7	AB	
PEST / PCBs  TAL INORGANICS  CLP HN03 to pH <2 1 x 1 L P TAL INORGANICS  CYANIDE  335.4  Maine DRO MEDEP HCL / 4 DEG. C 2 X 1 L AG Mine DRO CYANIDE  MIDEP HCL / 4 DEG. C 2 X 1 L AG Mine DRO MEDEP HCL / 4 DEG. C 2 X 1 L AG Mine DRO Mine DRO HZSO4 to pH <2 2 X 40 ML TOC USEPA 15.1 USEPA 16.0.2 USEPA 35.1.2 USEPA 15.1 USEPA 35.1.2 USEPA 16.0.2 USEPA 35.1.2 USEPA 35.1 USEPA 35.1.2 USEPA 35.1 USEPA 35.1.2 USEPA 35.1 USEPA 35.1.2 USEPA				HCL/4 DEG	. C 3 X 40	mL	vo	3		
CYANIDE    Maine DRO   MEDEP   HCL / 4 DEG. C   2X 1 L AG   Maine DRO							- DAGE			
Maine DRO TOC USEPA 415.1 USEPA 415.1 USEPA 415.1 USEPA 351.2 USEPA 415.1 USEP	10			HNO3 to pH	2 1x1L	P	2000			
USEPA 160.2 USEPA 351.2 USEPA	Maine DRO	MEDEP					Mai	ne DRO		
PURGE OBSERVATIONS PURGE WATER CONTAINERIZED  NOTES  All Equipment used either dedicated or deconned prior to arrival on site. No rinseate/ field blank required	TSS	USEPA 160.2		4 DEG. C	1 X 250	mL P	TSS	3		
PURGE OBSERVATIONS PURGE WATER CONTAINERIZED  NOTES  All Equipment used either dedicated or deconned prior to arrival on site. No rinseate/ field blank required								1		
PURGE OBSERVATIONS PURGE WATER PURGE WATER CONTAINERIZED VES NO GENERATED  NOTES  All Equipment used either dedicated or deconned prior to arrival on site. No rinseate/ field blank required	Pother Chartle Jultace	Speciant 3000	<u> </u>	MP	`_5	ec				
PURGE WATER CONTAINERIZED YES NO GENERATED  NOTES  All Equipment used either dedicated or deconned prior to arrival on site. No rinseate/ field blank required										-
All Equipment used either dedicated or deconned prior to arrival on site. No rinseate/ field blank required	PURGE WATER									
arrival on site. No rinseate/ field blank required	NOTES									
100	All Equipment used either dedicated or d	econned prior to								
	arrival on site. No rinseate/ field blank re	quired								
SIGNATURE: MACTEC	TA 140	1							MACTEC	

FIELD D	ATA REC	CORD - LO	W FLOW	ROUNDWAT	TER SAM	IPLING						
PROJECT	OJECT Pemp Olin bilmigion SAM			SAMPLE I.	.D. NUMBER		6W 2025			ROUND NO.		
EXPLORATIO	ON ID: GL	2025			SITE TYPE	E Su	per tund			DATE 8 21 07		
TIME S	START 114	15 EN	10 1230		JOB NUMBE	R 63	2000600	10	]	FILE TYPE		
WATER LEV	VEL / PUMP S	SETTINGS	70	JREMENT POINT OP OF WELL RISER OP OF PROTECTIVE	CASING	PROTECTIVE CASING ST	VE FICKUP 7	S FT	PROTECT CASING /	/WELL 3 -		
INITIAL DEPT TO WATE	TH ER 7	. /	FT WELL C	AND THE PARTY OF T		PID		2	WELL	20		
FINAL DEPT TO WATE	TH 7	.25	FT SCREE			AMBIENT A PID WELL MOUTH		PPM	WELL	WELL YES NO N/A		
DRAWDOW VOLUM (initial - fin	ME ()	024 ch) or x 0.65 (4-inc	GAL RATIO	O OF DRAWDOWN VO	/OLUME	PRESSURE TO PUMP		- PSI	1	CASING V LOCKED V COLLAR		
TOTAL VO PURGE (purge rat	ED 4		GAL uration (minutes) x	, 006 0.00026 gal/milliliter)		REFILL TIMER SETTING		/	DISCHAR TIMER SETTING	RGE		
PURGE DAT	TA DEPTH TO	PURGE	TEMP.	SPECIFIC CONDUCTANCE	pH	DISS. 02	TURBIDITY	REDOX	PUMP   INTAKE			
1150	7.15	RATE (ml/m)	(deg. c)	(ms/cm) 1, 93	(units)	(mg/L)	(ntu) 14.7	(mv)	DEPTH (ft)	COMMENTS		
	7,15	-7.00	15.5	1.93		0.88	18.4	56				
1200	1	1	15,5	1.93	6.37	1.12	9.69	58				
1205			15.5	1.93	6.37	1.09	11.6	59				
1210			15.5	1.96		0.45	11.6	60				
1215	V	V	15,5	1,95		0.90	7.61	60				
1220			15,5	1.45	The second second	0.91	10.0	59				
1225			15,5	1.93	6.50	88,0	9.7	60				
11230		Shap	· Ked						0 0			
TYPE OF  OED  SIMO  SIMO  GEO  ANALYTICA  To Be Collected  VOC-	D BLADDER ICO BLADDER OPUMP  AL PARAMETI C- ON-SITE LAB	TERS	HIGH DENS OTHER MI	NG PR TEFLON LINED SITY POLYETHYLEN  ETHOD UMBER DD-8021 608	NE PR	l.	ON VOLU REQUII G. C 2 X 40 r	RED mL	TEFLON OTHER  SAMPLE COLLECTED	- ON-SITE LAB		
TAL I CYAN Maine TOC TSS	T/PCBs INORGANICS INIDE THE DRO THE DR	LA AD Nor LATE . S.	usi usi	P P		4 DEG. C 4 DEG. C HNO3 to pH HCL / 4 DEG H2SO4 to pl 4 DEG. C H2SO4 to pl	3. C 2 X 1 L. H < 2 2 X 40 N 1 X 250 H < 2 1 X 1 L 2 4 2 5	AG P AG ML D mL P P	TAL II	T/PCBs NORGANICS		
PURGE OBS	SERVATIONS	;	NUMBER OF GA	AI LONS		LOCATION	SKETCH			1)		
CONTAINER		s (NO)	GENERATED									
NOTES												
All Equipmen	nt used either (	dedicated or deco	onned prior to									
arrival on site	e, No rinseate/	d field blank requi	ired							ŭ.		
SIGNATURE:	FI	Dal	1							MACTEC		

FIELD DATA RECORD	- LOW FLOW GROUNDW	ATER SAMPI	LING				
PROJECT PCMP	JLIN SAMPL	E I.D. NUMBER	6w 25			ROUND NO.	
EXPLORATION ID: 66	25	SITE TYPE	Super tund		DA	TE 8/21/07	
TIME START 1415	END 1545	JOB NUMBER	[12-22]		FILE TYP	E	
WATER LEVEL / PUMP SETTINGS	MEASUREMENT POINT TOP OF WELL RISI TOP OF PROTECT OTHER	ER PR	OTECTIVE SING STICKUP 3,	S FT	PROTECTIVE CASING / WELL DIFFERENCE	NA FT	
TO WATER 5. 91	FT WELL DEPTH (TOR)	FT AM	BIENT AIR	РРМ	WELL DIAMETER	1.5 IN	
FINAL DEPTH S. 5.5	PID	O WELL OUTH	РРМ	WELL INTEGRITY: CAP	YES NO NA		
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.6  TOTAL VOL PURGED (purge rate (milliliters per minute) x	GAL RATIO OF DRAWDOW TO TOTAL VOLUME  GAL time duration (minutes) x 0.00026 gal/millii	PURGED TO RE	ESSURE PUMP FILL MER TTING	PSI	CASING LOCKED COLLAR DISCHARGE TIMER SETTING	₹ = = =================================	
PURGE DATA  DEPTH TO PUR TIME WATER (ft) RATE (		ICE   pH   D	rISS. O2 TURBIDITY (mg/L) (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft) COI	MMENTS	
1430 4.1 330			07 31.6	-146	55, 11, 11, 11	MINERTO	
1435 /	13.3 1.07		24 25.1	-146			
1440	13.2 1.05		.13 25.1	-146		4 -	
1445	13.2 1.11		1.08 4.54	-147	ERROR	on Redux # J	
1455 V V	13.1 1.12	The second second	0,00 6.13	-148			
1500 Sam		00	7.12	, , ,			
					- 14		
EQUIPMENT DOCUMENTATION  TYPE OF PUMP	TYPE OF TUBING	TYPE C	OF PUMP MATERIAL	T	TYPE OF BLADDER MAT	ERIAL	
QED BLADDER	TEFLON OR TEFLON LINES	D PC	DLYVINYL CHLORIDE	Ē	TEFLON	annia de la companya del companya de la companya de la companya del companya de la companya de l	
SIMCO BLADDER	HIGH DENSITY POLYETHY	LENE ST	STAINLESS STEEL OTHER				
GEOPUMP	OTHER	01	THER				
ANALYTICAL PARAMETERS To Be Collected	METHOD NUMBER	<u>M</u>	SERVATION VOLU	RED C	SAMPLE OLLECTED		
VOC- ON-SITE LAB	MOD-8021 8260B		CL / 4 DEG. C 2 X 40 CL / 4 DEG. C 3 X 40 C		VOC- ON-SITE L	AB	
SVOC PEST / PCBs	CLP	4 D	DEG. C 2X1L DEG. C 2X1L	AG	SVOC PEST / PCBs		
TAL INORGANICS	CLP		IO3 to pH <2 1 x 1 L		TAL INORGANIC	s	
CYANIDE Maine DRO	335.4 MEDEP	HC	CL/4 DEG. C 2 X 1 L		CYANIDE Maine DRO		
TOC	USEPA 415.1 USEPA 160.2		SO4 to pH <2 2 X 40 DEG. C 1 X 250		TSS		
TKN Other Amasaca	USEPA 351.2		S04 to pH < 2 1 X 1 L	-	TKN		
Dother Cl Sulfare	10000 300.0		NP SO	20			
PURGE OBSERVATIONS			OCATION SKETCH				
PURGE WATER CONTAINERIZED YES NO	NUMBER OF GALLONS GENERATED	_					
NOTES							
All Equipment used either dedicated	or deconned prior to						
arrival on site. No rinseate/ field blar	nk required						
	0				J.	(()	
SIGNATURE: A los	(					MACTEC	

FIELD DATA RECO	ORD - LO	N FLOW G	ROUNDWAT	ER SAM	PLING					
PROJECT ON P	WIL	nington	SAMPLE I.D	). NUMBER	PZ	-16 PF	z,	]	ROUND NO.	
EXPLORATION ID: P.Z	- ICER	8.74		SITE TYPE	50	perfur	راء	]	DATE BIZING	
TIME START 9:5	O EN	11:20		JOB NUMBER	R 63	000600	210	]	FILE TYPE	
WATER LEVEL / PUMP SE	TTINGS	2º TO TO	REMENT POINT P OF WELL RISER P OF PROTECTIVE (	CASING C	PROTECTIV CASING STI	ICKUP	3.	CASING	/WELL	
INITIAL DEPTH TO WATER 3.	58	FT WELLD	PEPTH Q.0		(FROM GRO			WELL		
FINAL DEPTH S.	80	FT SCREEN	N Z		AMBIENT AI PID WELL MOUTH	N 12/	er.w	WELL YES NO N/A		
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch)		GAL RATIO	OF DRAWDOWN VO	OLUME F	PRESSURE TO PUMP	12/ E		1	CASING SE COLLAR SE COLLAR	
TOTAL VOL. PURGED (purge rate (milliliters per m		GAL	0.00026 gal/milliliter)		REFILL TIMER SETTING	7-11		DISCHAPTIMER SETTING	RGE N/A	
PURGE DATA  DEPTH TO TIME WATER (ft)	PURGE RATE (ml/m)	TEMP, (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS	
10:35 8.80	100	17.2	2.67	7.23	7.67	55.2	-181	11/1		
10:36	/	17.1	2.52		7.63		-179	10000		
10:41	_	1.5	2.46		7.61		-177	-		
10:44	-	17.1	2.45		7.72	15.8	-178			
10:50	+	17.1	2.42		8.16		-180			
10:53		1-3:1	2.39		8.23	-	-180			
	more	Cellec	1 1							
L	1150									
EQUIPMENT DOCUMENTA TYPE OF PUMP	TION	TYPE OF TUBIN	10	TVD	E OF PUMP	MATERIAL		TYPE OF BL	ADDED MATERIAL	
QED BLADDER			R TEFLON LINED	-		L CHLORIDE		TEFLON	ADDER MATERIAL	
SIMCO BLADDER			SITY POLYETHYLEN		STAINLESS			OTHER		
<b>⋈</b> GEOPUMP		OTHER_			OTHER		_			
ANALYTICAL PARAMETER	RS									
To Be Collected		<u>NI</u>	ETHOD UMBER		METHOD	REQUIP	RED	SAMPLE		
VOC- ON-SITE LAB			D-8021		HCL / 4 DEG			24 - 1 GOGNORE	- ON-SITE LAB	
voc svoc		826 CLF	P	4	HCL / 4 DEG 4 DEG. C	2 X 1 L	AG	Svo	C	
PEST / PCBs TAL INORGANICS		CLF			4 DEG. C HNO3 to pH	2 X 1 L / <2 1 x 1 L F			T / PCBs INORGANICS	
CYANIDE		335			V - N -			CYA	NIDE	
Maine DRO		USI	EPA 415.1	1	HCL / 4 DEG H2SO4 to ph	H <2 2 X 40 N	ИL	<b>□</b> тос		
TSS			EPA 160.2 EPA 351.2		4 DEG, C H2SO4 to ph			TSS		
	The Cour	1/50 COR	AC103061	B	200		500			
Other A1, C			60103	-	HNE		See	\ \ \		
PURGE OBSERVATIONS				1	LOCATION	SKETCH				
PURGE WATER	(10)	NUMBER OF GA	ALLONS							
CONTAINERIZED YES	(6)	GENERATED	-							
NOTES										
All Equipment used either de	dicated or deco	onned prior to								
arrival on site. No rinseate/ f	ield blank requi	ired								
									MACTEC	
SIGNATURE:	Dans	es/2								

FIELD DATA RECORD - LOW FLOW G	ROUNDWATER SAMPL	ING	
PROJECT Olim wilmingson	SAMPLE I.D. NUMBER	++m= 60-16	ROUND NO.
EXPLORATION ID: GW-16	SITE TYPE	Superfund	DATE 8/21/07
TIME START 15:00 END 17:00	JOB NUMBER	6300060010	FILE TYPE
AOT K	P OF PROTECTIVE CASING CAS	OTECTIVE SING STICKUP OM GROUND) FT	PROTECTIVE CASING / WELL DIFFERENCE FT
INITIAL DEPTH TO WATER  11.43 FT WELL DE (TOR)  FINAL DEPTH TO WATER  11.89 FT SCREEN	14.59 <sub>FT</sub> AME	BIENT AIR PPM	WELL LINE IN
DRAWDOWN VOLUME C.CZ GAL RATIO	OF DRAWDOWN VOLUME OTAL VOLUME PURGED TO I		WELL YES NO N/A INTEGRITY: CAP 2 CASING X LOCKED X COLLAR X DISCHARGE TIMER SETTING
PURGE DATA    DEPTH TO	(ms/cm) (units) (r		PUMP INTAKE DEPTH (ft) COMMENTS
15:13	0.123 5.36 2		N/V
15:16 / 18.0	0.121 5.28 3	.60 4.63 100	
15:19 \ 18.0	0.120 5.28 3	THE RESERVE THE PARTY OF THE PA	
15:22 18.0	0.119 5.29 z	.78 5.12 110 .78 4.27 111	
	0.118 5.29 2.		
15:35 Semple Collect			
	R TEFLON LINED POI	F PUMP MATERIAL LYVINYL CHLORIDE  AINLESS STEEL  HER	TYPE OF BLADDER MATERIAL  TEFLON  OTHER
ANALYTICAL PARAMETERS To Be Collected  VOC - ON-SITE LAB  VOC   SVOC   CLP   SVOC   CLP   PEST / PCBs   CLP   TAL INORGANICS   CLP   CYANIDE   335.   Maine DRO   MEE   TOC   USE   TSS   USE   TKN   USE   Other   A TOCK   STACK   S	PRESE IMBER D-8021  DB  HCL DB  HCL HNC  4 DEP HCL H2S PPA 415.1  EPA 351.2  H2S  ACOCOM	ERVATION VOLUME	SAMPLE COLLECTED  VOC ON-SITE LAB  VOC SVOC PEST / PCBs TAL INORGANICS CYANIDE Maine DRO TOC TSS TKN X
PURGE WATER CONTAINERIZED YES NOTES  All Equipment used either dedicated or deconned prior to arrival on site. No rinseate/ field blank required			MACTEC
SIGNATURE:	22		WACTEC

MACTEC ENGINEERING AND CONSULTING
FIELD DATA RECORD - SURFACE WATER/ SEDIMENT SAMPLING
PROJECT OINN, WILMINGTON JOB NUMBER 630060016 DATE 8/22/07
FIELD SAMPLE NUMBER SD-17 ACTIVITY TIME START 10:25 END 10:35 BOTTLE TIME 10:30
QC SAMPLES COLLECTED \\ \to / \hat{\hat{\hat{\hat{\hat{\hat{\hat{
SURFACE WATER DATA EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH AT LOCATION O.3 FT SPEC. COND 1.92 ms/cm BEAKER STREAM/ RIVER DECON FLUIDS USED:
DEPTH OF SAMPLE D.O. D.O. D.O. D.O. D.O. D.O. D.O. D.O
POTABLE WATER
TEMPERATURE 17.8 DEG C SALINITY PPM FILTER/ NUMBER MARSH OTHER
TURBIDITY 41.7 NTUS ORP 59 mV
PH ( 30
SEDIMENT DATA ASSOCIATED TRIP BLANK RINSATE BLANK
DEPTH OF SEDIMENT TYPE OF SEDIMENT: EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE DISCRETE ORGANIC HAND CORER DI WATER N2 PURGE
SAMPLE OBSERVATIONS GRAVEL S.S. SPOON POTABLE WATER  LIQUINOX
ODOR CLAY DREDGE OTHER
COLOROTHEROTHER
ANALYTICAL PARAMETERS
WATER METHOD PRESERVATION VOLUME SAMPLE COLLECTED
M Ammeria as N 107061B N Hascy Zsome & Scoone & N Scoone &
NITTIE
X Sulfax Schlende X 5p. Cen
> Dist Na, Cr, AI GOIOB Y HNO3
ANALYTICAL PARAMETERS SOIL METHOD PRESERVATION VOLUME SAMPLE
NUMBER METHOD REQUIRED COLLECTED
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SIGNATURE:
RECEIVED BY:

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MACTEC ENGINEERING AND CONSULTING
FIELD DATA RECORD - SURFACE WATER/ SEDIMENT SAMPLING
PROJECT Olin, Wilmington JOB NUMBER 6300060010 DATE 8122107
FIELD SAMPLE NUMBER PZ-17PR ACTIVITY TIME START 10:05 END 10:15 BOTTLE TIME 10:16
QC SAMPLES COLLECTED ~/A
SURFACE WATER DATA EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH AT LOCATION SPEC. COND Z.OU MS/CM BEAKER STREAM/ RIVER DECON FLUIDS USED:  PACS BOMB LAKE/ POND DI WATER N2 PURGE
DEPTH OF SAMPLE C.2 FT D.O. 7.32PM X PERISTALTIC PUMP SEEP POTABLE WATER
TEMPERATURE   16.0 DEG C   SALINITY   PPM   FILTER/ NUMBER   MARSH   MARSH   PPM
TURBIDITY 72.5 NTUS ORP - 117 mV OTHER OTHER
PH 5 92
SEDIMENT DATA ASSOCIATED TRIP BLANK RINSATE BLANK RINSATE BLANK RINSATE BLANK
DEPTH OF SEDIMENT: EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE DISCRETE ORGANIC HAND CORER DI WATER N2 PURGE
COMPOSITE SAND S.S. SPOON POTABLE WATER
SAMPLE OBSERVATIONS GRAVEL ALUMINIUM PAN LIQUINOX
ODOR CLAY DREDGE OTHER
COLOROTHEROTHER
ANALYTICAL PARAMETERS WATER METHOD PRESERVATION VOLUME SAMPLE NUMBER FILTERED METHOD REQUIRED COLLECTED
Ammonia as N 1076613 N HZSOU ZSOML X
Chieride 300.0 / N 500 m x
- HILLIZE - T
Sp.Con
DISS Na. ALICE GOICE THOS
ANALYTICAL PARAMETERS SOIL METHOD PRESERVATION VOLUME SAMPLE
NUMBER METHOD REQUIRED COLLECTED
NOTES
SIGNATURE:
RECEIVED BY:

MACTEC ENGINEERING AND CONS	UI TING		n.o. ! a. 1
FIELD DATA RECORD - SU		MENT SAMPLING	PAGE OF 1
20 4 6 kg	To a white the transfer of the state of the	Control of the Contro	
PROJECT OIT		NUMBER 630060010	DATE 812267
FIELD SAMPLE NUMBER \\ \SCC	ACTIVITY TIME	START 9:00 END 9:10	BOTTLE TIME 9:05
QC SAMPLES COLLECTED NO.	e		
SURFACE WATER DATA		EQUIPMENT USED TYPE OF SURFA	CE WATER
WATER DEPTH AT LOCATION 0.5	SPEC. COND 1.65 mS/C	The second secon	POSSES AND
DEPTH OF SAMPLE FROM SURFACE 0.2 FT	D.O. 4.45	☐ PACS BOMB ☐ LAKE/ PC	DND DI WATER N2 PURGE POTABLE WATER
TEMPERATURE 13.5 DEC.	SALINITY	FILTER/ NUMBER MARSH	
DEGC	РРМ	OTHER OTHER_	
TURBIDITY Z1.Z	ORP -G4 mV		0.000
PH 6.00 UNITS ASSOCIATED	TRIP BLANK	RINSATE BLANK P/A	
SEDIMENT DATA ASSOCIATED	TRIP BLANK	RINSATE BLANK	
DEPTH OF SEDIMENT	TYPE OF SEDIMENT:	EQUIPMENT FOR COLLECTION DECON FLUIDS USED	
TYPE OF SAMPLEDISCRETE	ORGANIC	HAND CORER DI WATER N2 PURG	E
COMPOSITE	SAND	S.S. SPOON POTABLE WATER	
SAMPLE OBSERVATIONS	GRAVEL	ALUMINIUM PAN LIQUINOX	
ODOR	CLAY	DREDGEOTHER	
COLOR	OTHER	OTHER	
ANALYTICAL PARAMETERS WATER	METHOD	PRESERVATION VOLUME SAMPLE	
	NUMBER FILTERED	METHOD REQUIRED COLLECT	
w Chloride	300.0 N	HORE SOOML	
A HITTONE	$\pm$ $\pm$		
> Sulfase	1 1		
YWALLE DISS	6010B Y	HNG3 SOOML X	
The MICH, Toral	6010B N	HNOZ SCONL	
ANALYTICAL PARAMETERS SOIL	METHOD	PRESERVATION VOLUME SAMPLE	
	NUMBER	PRESERVATION VOLUME SAMPLE METHOD REQUIRED COLLECTION	22.5.5.1
l		——— H	
	-		
	( <del></del>		
NOTES			
1			
		SIGNATURE:	n/ce
		RECEIVED BY:	

MACTEC ENGINEERING AND CONSULTING  PAGE OF
FIELD DATA RECORD - SURFACE WATER/ SEDIMENT SAMPLING
PROJECT OILD, WILMINGTON JOB NUMBER 6300600 DATE 5)22/01
FIELD SAMPLE NUMBER PZ - 18 R ACTIVITY TIME START 10:40 END 10:50 BOTTLE TIME 10:45
QC SAMPLES COLLECTED ~/A
SURFACE WATER DATA EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH AT LOCATION SPEC. COND SPEC. CON
DEPTH OF SAMPLE D.O. 3.59PM PACS BOMB LAKE/ POND DI WATER N2 PURGE PROM SURFACE POND DI WATER N2 PURGE POTABLE WATER
TEMPS DATING CONTROL C
TURBIDITY ORP ORP OTHER OTHER
NTUS 224 mV
PH 6.47 UNITS ASSOCIATED TRIP BLANK N/A RINSATE BLANK N/A
SEDIMENT DATA ASSOCIATED TRIP BLANK RINSATE BLANK
DEPTH OF SEDIMENT: EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE DISCRETE ORGANIC HAND CORER DI WATER N2 PURGE
COMPOSITE SAND S.S. SPOON POTABLE WATER
SAMPLE OBSERVATIONS GRAVEL ALUMINIUM PAN LIQUINOX
ODOR DREDGEOTHER
COLOROTHEROTHER
ANALYTICAL PARAMETERS WATER METHOD PRESERVATION VOLUME SAMPLE NUMBER FILTERED METHOD REQUIRED COLLECTED
N American Lindows Lindows Town
A Chloride Boo.c N None Social M
\( \bar{\bar{\bar{\bar{\bar{\bar{\bar{
29. Ces
X Piss Na, Cr. Al CODB Y HNC3
ANALYTICAL PARAMETERS
SOIL METHOD PRESERVATION VOLUME SAMPLE NUMBER METHOD REQUIRED COLLECTED
NOTES
SIGNATURE:
RECEIVED BY:

MACTEC ENGINEERING AND CONSULTING
FIELD DATA RECORD - SURFACE WATER/ SEDIMENT SAMPLING
PROJECT OIN, WILMINGTON JOB NUMBER 6300060010 DATE 5/22/07
FIELD SAMPLE NUMBER 15CC -3 ACTIVITY TIME START 8:45 END 8:55 BOTTLE TIME 8:50
OC SAMPLES COLLECTED NJA
SURFACE WATER DATA EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH SPEC. COND CI. 534 ms/cm BEAKER STREAM/ RIVER DECON FLUIDS USED:
DEPTH OF SAMPLE C.3 FT D.O. PACS BOMB LAKE/ POND DI WATER N2 PURGE
THOM SOLITON SHEET SEED TO TRADEC WATER
TEMPERATURE 14.2 DEG C SALINITY PPM FILTER/ NUMBER MARSH
TURBIDITY S . 11/
PH
5.56 UNITS ASSOCIATED TRIP BLANK N/A RINSATE BLANK N/A
SEDIMENT DATA ASSOCIATED TRIP BLANK RINSATE BLANK
DEPTH OF SEDIMENT: EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE DISCRETE ORGANIC HAND CORER DI WATER N2 PURGE
COMPOSITE SAND S,S, SPOON POTABLE WATER
SAMPLE OBSERVATIONS GRAVEL ALUMINIUM PAN LIQUINOX
COLOR OTHER OTHER
COLON
ANALYTICAL PARAMETERS
WATER METHOD PRESERVATION VOLUME SAMPLE NUMBER FILTERED METHOD REQUIRED COLLECTED
Ammenia as N 1270618 N 172504 ZSOWL D
N HITTORE C T
5- 5-18
> teralmo, Alich Geles C HAICS
DISS Na, Alice
ANALYTICAL PARAMETERS
SOIL METHOD PRESERVATION VOLUME SAMPLE NUMBER METHOD REQUIRED COLLECTED
NOTES
SIGNATURE:
RECEIVED BY:

MACTEC ENGINEERING AND CONSULTING
FIELD DATA RECORD - SURFACE WATER/ SEDIMENT SAMPLING
Electrical Control of the Control of
PROJECT 01) n. WIIMINGTON JOB NUMBER 63000014 DATE 8/22/47
FIELD SAMPLE NUMBER 15CC-1 ACTIVITY TIME START 10:55 END 11:05 BOTTLE TIME 11:49C
QC SAMPLES COLLECTED DUP , MS, MSD
SURFACE WATER DATA EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH AT LOCATION FT SPEC. COND C. 44 ms/cm BEAKER STREAM/ RIVER DECON FLUIDS USED:
DEPTH OF SAMPLE D.O. D.O. D.O. D.O. D.O. D.O. D.O. D.O
FROM SURFACE FIT PPM PERISTALTIC PUMP SEEP POTABLE WATER
TEMPERATURE 17.6 DEG C SALINITY PPM FILTER/ NUMBER MARSH
TURBIDITY 8.03 NT IS ORP 5.0 MY
1110
PH G-72 UNITS ASSOCIATED TRIP BLANK N/A RINSATE BLANK N/A
SEDIMENT DATA ASSOCIATED TRIP BLANK RINSATE BLANK
DEPTH OF SEDIMENT TYPE OF SEDIMENT: EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE DISCRETE ORGANIC HAND CORER DI WATER N2 PURGE
COMPOSITE SAND S.S. SPOON POTABLE WATER
SAMPLE OBSERVATIONS GRAVEL ALUMINIUM PAN LIQUINOX
ODOR CLAYDREDGEOTHER
COLOROTHEROTHER
ANALYTICAL PARAMETERS WATER METHOD PRESERVATION VOLUME SAMPLE
NUMBER FILTERED METHOD REQUIRED COLLECTED  Ambrenia as N 1030618 N 132504 Z50N >
Surface Spece
Sulfere S
DISSING, ALICE GOOD Y JUNO3
ANALYTICAL PARAMETERS
SOIL METHOD PRESERVATION VOLUME SAMPLE
NUMBER METHOD REQUIRED COLLECTED
NOTES
NOTES .
SIGNATURE:
RECEIVED BY:
599/95/90007-7509

MACTEC ENGINEERING AND CONSULTING
FIELD DATA RECORD - SURFACE WATER/ SEDIMENT SAMPLING
PROJECT OILD, WILMINGEN JOB NUMBER 63000001 DATE 5122107
FIELD SAMPLE NUMBER P2-1675W ACTIVITY TIME START 9:50 END 10:00 BOTTLE TIME 9:54
QC SAMPLES COLLECTED W/A
SURFACE WATER DATA EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH O.3 FT SPEC. COND 2.81 MS/CM BEAKER STREAM/ RIVER DECON FLUIDS USED:
DEPTH OF SAMPLE D.O. 10,5 φpm PACS BOMB LAKE/ POND DI WATER N2 PURGE  FROM SURFACE FT D.O. 10,5 φpm POTABLE WATER
TEMPERATURE [O, 48 DEG C] SALINITY DEG C SALINITY DEG C SALINITY DOTHER
TURBIDITY 72.5 NTUS ORP - 40 mV
PH G. 67 UNITS ASSOCIATED TRIP BLANK P/A RINSATE BLANK P/A
SEDIMENT DATA ASSOCIATED TRIP BLANK RINSATE BLANK
DEPTH OF SEDIMENT TYPE OF SEDIMENT; EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE
COMPOSITE SAND S.S. SPOON POTABLE WATER
SAMPLE OBSERVATIONS GRAVEL ALUMINIUM PAN LIQUINOX
ODOROTHER
COLOR OTHER OTHER
ANALYTICAL PARAMETERS WATER METHOD PRESERVATION VOLUME SAMPLE NUMBER FILTERED METHOD REQUIRED COLLECTED
Ammenia as N 1670618 N 147504 Z50M D
Sulfacer  Sulfacer  Sp. Con
Dissiba, Cr. Al Golos Y HNos
ANALYTICAL PARAMETERS SOIL METHOD PRESERVATION VOLUME SAMPLE
NUMBER METHOD REQUIRED COLLECTED
NOTES
SIGNATURE:
RECEIVED BY:

#### **APPENDIX B**

## **Chains of Custody**



43146

•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

•149 Rangeway Road N. Billerica, MA 01862 (P) 978-667-1400

STL Westfield

(F) 978-667-7871

STL Billerica / Service Center

Client: MACTEC				Pro	ject a	#:_	63	00	06	0	زد	0	F	>_	M	P	Jo	b#				蒙	Q	uote	#	h			2	PO	#			
Address: 107 Sudubo	n Rd.			Project Ma	nage	r: _	P	To	,	14	ויילני	05	1	į,			100	200	ded		1	-			е	15	0		C	omm	ents			
WATEFIELD	William Street				ork IE							17771				A) (S)	CF2157	heck	Ana anal	/sis	and	spec	ify m	etho		0	į.	(Sp	ecia	l Ins	tructi	ions)		See See
Phone: 787 295 6474 Fa	ix:			Co	ontac	t:	P	ر ،	_	0	- 0		F 1	776	w				alyte mple:		com	ment	s se	ction		Plèa	Seip	int l	egibil	ity. If	the ar	nalytica	al	poni
Requested Turnaround Time (PLE		FY)		Regulatory Cla							ecia	al R	ерс	ort F	orn	nat			ries fo					-0		-1.00 E-10.00	JULY 0.57-671					d on th		
STANDARD   RUSH	l Approval	Requ	iired)	NPDES RCRA Other					1		DQ DE	P Fo	/CP	) Rp (s)	ot _		60 80	000-s 000-s	ries fo eries t eries t mmen	or gr	ound	water water	, soil	wast wast	е	will	begi	afte		questi		und tin ave be		
Sample Type Codes  WW-Wastewater DW-Drinking wat  W-Lab water GW-Groundwater  S-Solid / Soil SL-Sludge O-O	A-Air		<i>r</i> ater	Date			iss(G)	H(	Pro 2	ese 2>	rva	>15		IRDA IRDED	602 /8021	1625 /8270	Herbicide			/ 200.7	17470-71	ııstry		/ TOC	ther	) o.o		Series	CONTRACT OF	<b>S</b>	7			
Sample ID		Sample Type	Sampler's Initials	Time Collected	Grab	Comp.	# Containers Plastic(P) or Gla	NaHSO4/MeOH	HNO3 to pH <	2000	HCI to pH <2	I	Na2S203	None / 4° C	Volatiles 601 /602 /8021	Semivoa 525	est /	EPH / VPH	DRO / GRO	Metals 6010 /	Mercury 245.1 / 7470-7	General Chemistry	Toxicity	Oil & Grease	Radchem / Other	EPA 320	19	950 B		190201	\$ <			
GW-24	NATIONAL PROPERTY.		TRU	8/21/47	X	3	建成		K	X				X						K						X	1	X		Υ				
GW-202			TEH	1230	X	3	3 P		1	1				4						1						1	1	1						
6W-15	(	كهادك	Tell	1500	X	3	P																					$\parallel$	1,					
PZ 16 RR		Slv	DLC	8/2/47	X	3	P	)																										
P2 17 RR	(	64	DLC	\$121107 1225	X	Š	P	<u> </u>		1													-					1						
PZ 18 R	- (	36/	DLC	8121107	K	3	P		$\ \cdot\ $	1				1						$\downarrow \downarrow$							1	Ц						
(F) - 6W-16-		5W	DL	1535	X	- 3	P	-	+					#						4	4					4	#							
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#### **APPENDIX C**

# Third Quarter 2007 Temporary Cap Inspection Photo Log

### MACTEC Engineering and Consulting August 28, 2007

# Temporary Cap Inspection 51 Eames Street Facility



Photograph 1: Well penetrations



Photograph 2: Patch degradation

### MACTEC Engineering and Consulting August 28, 2007

# Temporary Cap Inspection 51 Eames Street Facility



Photograph 3: Rafts of vegetation on cap.



Photograph 4: Water between layers

## MACTEC Engineering and Consulting August 28, 2007

# Temporary Cap Inspection 51 Eames Street Facility



Photograph 5: Failed patch

### **APPENDIX A**

## **Interim Response Steps Field Activity Reports**

A-2 Fourth Quarter 2007 Sampling Event

### **APPENDIX A**

## **Interim Response Steps Field Activity Reports**

A-2 Fourth Quarter 2007 Sampling Event

#### INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT FOURTH QUARTER 2007 SAMPLING EVENT OLIN CHEMICAL SUPERFUND SITE WILMINGTON, MASSACHUSETTS



### engineering and constructing a better tomorrow

December 20, 2007

Mr. Steve Morrow, P.E. Olin Corporation 1186 Lower River Road Charleston, TN 37310

Subject: Interim Response Steps Field Activity Report

Fourth Quarter 2007 Sampling Event

Olin Chemical Superfund Site Wilmington, Massachusetts

MACTEC Project No. 6300060010-81.17

Dear Mr. Morrow:

MACTEC Engineering and Consulting, Inc. (MACTEC) is pleased to submit the Interim Response Steps Field Activity Report for the fourth quarter 2007 sampling event.

Sincerely,

MACTEC Engineering and Consulting, Inc.

Peter H. Thompson

Project Manager with permission

Michael J. Murphy

Senior Principal Scientist

With penniss ru

#### INTERIM RESPONSE STEPS FIELD ACTIVITY REPORT FOURTH QUARTER 2007 SAMPLING EVENT **OLIN CHEMICAL SUPERFUND SITE** WILMINGTON, MASSACHUSETTS

Prepared for:

Olin Corporation Wilmington, Massachusetts

Prepared By:

MACTEC Engineering and Consulting, Inc. 107 Audubon Road, Building 2, Suite 301 Wakefield, Massachusetts

MACTEC PROJECT NO. 6300060010-81.17

December 20, 2007

with permission

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Interim Response Steps Field Activity Report, Fourth Quarter 2007 Sampling Event MACTEC Engineering and Consulting, Inc. Project No. 6300060010-81.17

### **GLOSSARY OF ACRONYMS**

DO Dissolved Oxygen

IRSWP Interim Response Steps Work Plan

MACTEC Engineering and Consulting, Inc.

MassDEP Massachusetts Department of Environmental Protection

MCP Massachusetts Contingency Plan

ORP Oxidation/Reduction Potential

SC Specific Conductivity

SOPs Standard Operating Procedures STL Severn Trent Laboratories

USEPA U.S. Environmental Protection Agency

UV ultraviolet

## 1.0 INTRODUCTION

This sampling summary report presents the field activities completed in association with the Fourth Quarter 2007 surface water and groundwater sampling event for the Slurry Wall/Cap Monitoring Program, the Cap Inspection, and the groundwater sampling for the Plant B Monitoring Program.

### 2.0 SLURRY WALL/CAP MONITORING PROGRAM

The purpose of the Slurry Wall/Cap Monitoring Plan surface water, groundwater, and sediment sampling and analysis activities is to monitor the concentrations of selected surface water, groundwater, and sediment constituents in portions of the South Ditch and in selected Site monitoring wells and to measure collect a synoptic round of water level measurements.

Groundwater, surface water, and sediment locations which were sampled and the monitoring wells where groundwater levels were measured during the Fourth Quarter 2007 event are shown in **Table 1** and **Figure 1**. The Fourth Quarter 2007 groundwater and surface water monitoring program included the sampling of groundwater from seventeen monitoring wells and three piezometers, the collection of surface water samples from seven locations within the South Ditch, the collection of five sediment samples, and the gauging of water levels in twenty three monitoring wells and piezometers. Surface water and groundwater sampling was proposed in the MACTEC Engineering and Consulting, Inc. (MACTEC's) "Draft Interim Response Steps Work Plan" dated July 25, 2007. The Draft Interim Response Steps Work Plan (IRSWP) contained recommendations for continued monitoring "in accordance with the requirements of the most recent Massachusetts Department of Environmental Protection (MassDEP) approved monitoring program until U.S. Environmental Protection Agency (USEPA) approval of the IRSWP." This was accomplished during the Fourth Quarter 2007 Monitoring Program.

Seventeen monitoring well and three piezometer locations were sampled using low stress (low flow) groundwater sampling methods. During sampling activities the purged groundwater was continuously monitored with a Horiba U-22 water quality instrument for pH, specific conductivity (SC), dissolved oxygen (DO), oxidation/reduction potential (ORP), and temperature. Upon stabilization of these parameters, groundwater samples were collected for laboratory analysis. Synoptic water level measurements were collected on November 9, 2007 prior to the daily discharge from the Plant B treatment area to the South Ditch. Surface water samples were collected on November 12, 2007 and were submitted for laboratory analysis. Groundwater samples were collected November 13 and 14, 2007. Sediment samples were collected on November 16, 2007 and submitted for laboratory analysis.

#### 2.1 SCOPE OF WORK

Groundwater samples were collected from each monitoring well and piezometer for both field and laboratory analysis in accordance with the Standard Operating Procedures (SOPs) in Appendix A of the Draft IRSWP. Analytical methods utilized for laboratory testing of groundwater are shown in **Table 2**. Prior to collection of groundwater, all monitoring wells were purged in accordance with USEPA 1996 low stress (low flow) guidelines and field indicator parameter measurements were obtained using a Horiba U-22 instrument equipped with a flowthrough cell. The stabilization criteria are included in Appendix A of the Draft IRSWP. Well purging was continued at each location until the field indicator parameters were stable and samples were subsequently collected. The final low flow purging field parameter information at stabilization is presented in **Table 3**. The field data records for the groundwater sampling are contained in Appendix A. Two Horiba U-22 groundwater monitoring instruments were calibrated each day using standard auto-calibration solution. No readings outside manufacturer supplied calibration ranges were noted in the daily case narrative. The field instrument calibration records are contained in Appendix A. In addition, a 0.45-micron pore diameter, inline Teflon<sup>TM</sup> filter was used to field filter samples collected for filtered metals. During the sampling activities flow rates were generally maintained at approximately 350 milliliters per minute. During the low-flow monitoring well purging, flow rates and groundwater indicator parameters were measured and recorded to monitor the stability of groundwater parameters.

Consistent with the previous monitoring activities, the purged groundwater from each monitoring well was collected in collapsible plastic containers and pursuant to the Massachusetts Contingency Plan (MCP) (310 CMR 40.0045), was returned to the monitoring well subsequent to sample collection.

A synoptic round of water level measurements using an electronic water-level indicator was completed for twenty three monitoring well and piezometer locations prior to initiating sampling activities. The groundwater level measurements obtained during this event are summarized in **Table 4**. The monitoring well and piezometer locations are shown in **Figure 1**.

Groundwater and surface water samples were collected in properly preserved laboratory-supplied containers, field filtered if appropriate according to Appendix A of the Draft IRSWP, and placed on ice for delivery to TestAmerica (formerly Severn Trent Laboratories (STL)) under chain-of-

MACTEC Engineering and Consulting, Inc. Project No. 6300060010-81.17

custody. The samples were delivered to the TestAmerica Westfield, MA facility for chemical analyses. Copies of the chain-of-custody documents are provided in Appendix B.

Surface water samples were collected in laboratory supplied bottles. These samples were collected by submerging dedicated tubing attached to a peristaltic pump in the standing water approximately one (1) inch above the stream substrate, and then filling the appropriate laboratory supplied pre-preserved bottles. Peristaltic pumps were selected to reduce the entrapment of floating or suspended sediment in the sample, while providing positive pressure in order to filter samples for filtered metals. The sampling locations are shown on Figure 1. The sequence of surface water sample collection was from the downstream to the upstream sample locations. The laboratory analytical program for surface water samples is summarized in **Table 5**.

Field indicator parameters were obtained at each location prior to sampling using a Horiba U-22 instrument equipped with a flow-through cell. In addition, a 0.45-micron pore diameter, in-line Teflon<sup>TM</sup> filter was used to field filter all samples collected for filtered metal analysis. Final surface water sampling field parameters are included in Table 6. The field data records for the surface water sampling are contained in Appendix A.

Depth of surface water was measured in each location prior to sampling. Surface water measurements were obtained from seven locations within the South Ditch. The surface water depth measurements obtained during this event are included in **Table 6**.

Surficial sediment samples were collected, from within the ditch system, from five locations that are identified in Table 1 and in Figure 1. Table 7 presents the laboratory analytical program (metals) for these samples. The samples were collected by hand auger, mixed in stainless steel bowls, and were placed in sample containers. Samples were transmitted to Test America on ice and under chain of custody. The field data records for the sediment sampling are contained in Appendix A.

#### 2.2 WELL RECONNAISSANCE

Site reconnaissance of the monitoring well locations in the Slurry Wall/Cap Monitoring Program was performed. Data loggers were deployed on November 19, 2007 in five monitoring wells: GW-10S, GW-35S, GW-CA1, GW-76S and GW-78S.

#### 2.3 CAP INSPECTION

The fourth quarter inspection of the temporary cap was conducted on November 15, 2004. The temporary cap is composed of ten large and three small scrim reinforced polyethylene sheets of 8 mil thickness (**Figure 3**). These sheets are composed of smaller, narrower panels that were factory seamed to produce the large sheets. The factory seams are double welded seams. The seams between the large sheets were field fabricated by folding and sewing the edges of the sheets together with an ultraviolet (UV) resistant thread. The original temporary cap was installed in 2001 and consisted of a 6 mil thick sheet. Due to deterioration of the 6 mil sheet, it was replaced by the current 8 mil thick cover in 2003. The 8 mil cover was placed directly over the 6 mil cover and re-ballasted with sand bags to resist wind uplift. Quarterly inspections of the 8 mil cover were instituted in 2003 to evaluate the need for periodic maintenance and to document maintenance and repair activities.

#### 2.3.1 Activities Completed During This Inspection Included

- Walking and inspecting the sewn seams for evidence of deterioration of the UV resistant thread.
- Creating a panel layout map to depict location of sewn seams (**Figure 1**).
- Observing areas of sewn seams that were in low spots and in contact with or submerged under ponded water.
- Checking sand bags where vegetation has rooted to verify that roots do not penetrate the polyethylene cover.
- Completing repairs, using a 3-inch width heavy duty tarpaulin repair tape, on all new (previously not-repaired) holes in the polyethylene cover that could be identified during the inspection.
- Completing repairs on all observed older patches where the patch material was beginning to fail or had failed.
- Completing repairs on stress tears near and around well penetrations.
- Providing photo-documentation of typical repairs and conditions.
- Raising some of the submerged seams, where possible, above surrounding ponded water, and moving sandbags at other locations where the seams were being held in a submerged condition.

#### 2.3.2 Observations During This Inspection Included

- The black polyethylene membrane shows some surface discoloration but is still flexible and has not become brittle due to UV exposure indicating its carbon black content is still effectively protecting the sheet.
- The UV resistant thread in the sewn seams has not deteriorated indicating that the sewn seams integrity remains in good condition.
- Factory double welded seams are intact and do not show signs of separation, tearing or deterioration.
- Many of the older repairs and patches made with repair tape had failed or had begun

Interim Response Steps Field Activity Report, Fourth Quarter 2007 Sampling Event MACTEC Engineering and Consulting, Inc. Project No. 6300060010-81.17

- to fail due to loss of adhesion of the repair tape or deterioration of the tape itself.
- Most of the damage to the cover consists of small holes.
- A few isolated areas are present where water has become trapped between the 6 mil and 8 mil sheeting which results in a "water bed" like condition.
- Many small areas of ponded water are present over the entire cover.
- Many sand bags have deteriorated allowing the sand to spill out and many have become vegetated by seeds that been deposited by wind or biological mechanisms.

#### 2.3.3 Discussion

The general physical condition of the polyethylene is good considering its age and service conditions (direct exposure to sunlight and the elements). The presence of ponded water does not necessarily signify leakage in those ponded areas. The presence of ponded water suggests that the underlying polyethylene sheeting is intact and is not leaking, or is not leaking extensively. Much of the water loss from ponded areas is probably due to evaporation. The general pattern of ponded water on the cover is consistent with older survey data of the temporary cap area. The cap is internally graded to a drain which outlets to the sedimentation basin located to the south between the containment area and South Ditch. Although some sub grade settlement may have occurred, the topographic pattern matches fairly well the distribution of ponded water observed on the cap and which can be seen in **Figure 1**.

The deterioration of the sand bags does not adversely affect their purpose which is to place weight on the cover to resist wind uplift forces. The sand has not migrated from the cover, and that weight with the additional weight of the small areas of ponded water, are adequate to protect the polyethylene sheet from wind uplift and related wind damage. There is no need to replace the sandbags.

The polyethylene sheet has serviceable life remaining and will continue to perform its intended function until such time as the UV protection afforded by its carbon black content fails to protect the polymer from significant deterioration.

#### 2.3.4 Recommendations

All observed holes and perforations have been repaired with a repair tape. The service life of the repair tape used in the past may be inferior to other tapes available on the market. It is recommended that the polyethylene tape with a mastic backing that is typically used on shrink wrap polyethylene covers (marine industry use) be tried as an alternative repair tape.

### 3.0 PLANT B MONITORING PROGRAM

The purpose of the Plant B groundwater sampling and analysis program is to monitor the concentrations of selected groundwater constituents and to record groundwater levels.

The Fourth Quarter 2007 collection of synoptic water levels was conducted by Olin personnel on November 9, 2007. Groundwater sampling was conducted on November 15, 2007.

Synoptic water level measurements were completed on November 9, 2007. Groundwater samples were collected from six monitoring locations during this Plant B area sampling event. During sampling activities the purged groundwater was continuously monitored with a Horiba U-22 water quality instrument for pH, SC, DO, ORP, and temperature. Upon stabilization of these parameters, groundwater samples were collected for laboratory analysis. Groundwater sampling was conducted on August 21, 2007.

#### 3.1 SCOPE OF WORK

Groundwater samples were collected from six locations for both field and laboratory analysis in accordance with the SOPs in Appendix A of the Draft IRSWP. The six groundwater sampling locations are listed in **Table 8** and are shown in **Figure 2**. The analytical program for these groundwater samples is summarized in **Table 9**. Prior to collection of groundwater samples, the monitoring wells were purged in accordance with USEPA 1996 low stress (low flow) guidelines and the following field indicator parameter measurements were obtained: pH, SC, temperature, DO and ORP. The field parameter data were collected using a Horiba U-22 instrument equipped with a flow-through cell. During the sampling activities, flow rates were generally maintained at approximately 350 milliliters per minute. During the low-flow purging, flow rates and groundwater indicator parameters were measured and recorded to monitor the stability of groundwater parameters. The stabilization criteria are included in Appendix A of the Draft IRSWP. Well purging was continued until the field indicator parameters were stable and samples were subsequently collected. Field instrumentation calibration records and field data records are contained in Appendix A. The final low-flow purging field parameter information at stabilization is presented in **Table 10**.

Consistent with the previous monitoring activities, the purged groundwater from each monitoring well was collected in collapsible plastic containers and pursuant to the MCP (310 CMR 40.0045),

was returned to the monitoring well subsequent to sample collection.

Groundwater samples were collected in properly preserved laboratory-supplied containers, and placed on ice for delivery to TestAmerica courier under chain-of-custody procedures. The samples were successfully delivered to the TestAmerica Westfield, MA facility for chemical

analyses. Copies of the chain-of-custody documents are provided in Appendix B.

Groundwater levels were measured to the nearest 0.01 feet in each well location using an electronic water-level indicator. Groundwater measurements were obtained from twenty eight monitoring and interceptor/extraction well locations. The monitoring locations are identified and the groundwater levels for this sampling event are summarized in **Table 11**. The monitoring well locations are shown in **Figure 2**.

3.2 WELL RECONNAISSANCE

Reconnaissance of the twenty eight wells and one staff gauge location in the Plant B program was performed. The staff gauge (East Ditch) could not be located. No maintenance activities were identified for the wells.

At conclusion of the monitoring program, a vehicle struck monitoring well GW-16 (located west of the office trailer) damaging the surface casing and internal PVC riser pipe. Damage to the well and repair options are being assessed. Any necessary repairs will be made prior to the next sampling event if possible (weather permitting).

Interim Response Steps Field Activity Report, Fourth Quarter 2007 Sampling Event MACTEC Engineering and Consulting, Inc. Project No. 6300060010-81.17

# **TABLES**

# Table 1 Groundwater, Surface Water, and Sediment Sampling Locations Slurry Wall/Cap Monitoring Program Fourth Quarter 2007 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Ground Water	Surface Water	Sediment
GW-10S	ISCO1	SD-SD1
GW-24	ISCO2	SD-SD2
GW-25	ISCO3	SD-SD3
GW-26	PZ-16RR	SD-SD4
GW-34SR	PZ-17RR	SD-SD5
GW-34D	PZ-18R	
GW-35S	SD-17	
GW-39		
GW-42S		
GW-55S		
GW-76S		
GW-78S		
GW-79S		
GW-201S		
GW-202S		
GW-202D		
GW-CA1		
PZ-16RR		
PZ-17RR		
PZ-18R		

**Bolded** locations - samples were also collected for field duplicates. Shaded locations - samples were also collected for MS/MSD.

Prepared by: KJC 12/19/07 Checked by: BJR 12/19/07

# Table 2 Groundwater Laboratory Analytical Program Slurry Wall/Cap Monitoring Program Fourth Quarter 2007 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	LAC 107-06-1	0.1	mg/L
Chloride	EPA 300.0	1	mg/L
Specific Conductivity	SM18 2510B	1	µmhos/cm
Sulfate	EPA 300.0	2	mg/L
Filtered Metals			
Aluminum, filtered	SW846 6010B	100	μg/L
Chromium, filtered	SW846 6010B	5	μg/L

Notes: Prepared by: DLC NA - not applicable Checked by: KJC

mg/L - milligrams per liter

µmhos/cm - micromhos per centimeter

μg/L - micrograms per liter

Table 3
Final Field Parameters for Groundwater Sampling
Slurry Wall/Cap Monitoring Program
Fourth Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Monitoring Well Samples																	
Location	GW-25	GW-79S	GW-202S	GW-202D	GW-10S	GW-201S	GW-24	GW-26	GW-34D	GW-34SR	GW-35S	GW-39	GW-42S	GW-55S	GW-76S	GW-78S	GW-CA-1
Date	11/13/2007	11/14/2007	11/13/2007	11/13/2007	11/13/2007	11/14/2007	11/14/2007	11/13/2007	11/13/2007	11/13/2007	11/14/2007	11/13/2007	11/12/2007	11/13/2007	11/13/2007	11/14/2007	11/14/2007
Depth to Water (ft)	5.67	3.50	6.54	6.12	8.95	5.01	10.2	4.24	8.05	9.23	7.95	3.94	3.7	2.91	7.73	4.39	7.19
pH (standard units)	6.93	6.21	6.26	5.82	3.97	6.64	8.26	5.89	6.33	5.76	7.04	5.39	4.95	4.34	5.79	5.16	6.90
Conductivity (µmhos/cm)	1,570	2,210	1,800	3,620	132	3,970	537	460	116	180	863	932	260	2,200	240	1,360	897
Discrete ad a constant (see all )	-0.4	.0.4	-0.4	0.05	-0.4	-0.4	40.00	-0.4	0.04	4.45	4 74	4.40	-0.4	-0.4	-0.4	-0.4	0.45
Dissolved oxygen (mg/L)	<0.1	<0.1	<0.1	0.05	<0.1	<0.1	10.83	<0.1	0.91	4.45	1.74	4.42	<0.1	<0.1	<0.1	<0.1	0.45
Temperature (°Celcius)	12.63	12.39	14.49	13.72	13.58	12.74	12.45	13.79	13.92	13.32	16.99	10.62	14.69	11.56	13.74	14.00	14.33
remperature (*Celcius)	12.03	12.39	14.49	13.72	13.36	12.74	12.45	13.79	13.92	13.32	10.99	10.62	14.09	11.50	13.74	14.00	14.55
Redox (millivolts)	-89	-50	74	153	196	37	-93	-89	134	126	-237	290	-167	251	93	153	117

Piezometer Samples			
Location	PZ-16RR	PZ-17RR	PZ-18R
Date	11/14/2007	11/14/2007	11/14/2007
Depth to Water (ft)	3.56	2.86	3.28
pH (standard units)	7.36	7.49	7.23
Conductivity (µmhos/cm)	2,300	1,350	563
Dissolved oxygen (mg/L)	10.30	9.86	< 0.1
Temperature (°Celcius)	8.61	11.76	9.27
	<u> </u>		
Redox (millivolts)	-172	-119	-95

Notes:

ft - feet

μmhos/cm - micromhos per centimeter

mg/L - milligram per liter

Prepared by: DLC Checked by: MH

Table 4
Synoptic Groundwater Elevations
Slurry Wall/Cap Monitoring Program
Fourth Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL/	Reference		Depth To	Corrected	Measured
SG- ID	Elevation	Notes	Water	Elevation	Date
I.D.	(ft msl)		(f)		
GW-10S	89.10		8.92	80.18	11/9/2007
GW-24	83.43		2.69	80.74	11/9/2007
GW-25	85.97		5.30	80.67	11/9/2007
GW-26	84.93		4.13	80.80	11/9/2007
GW-34D	90.38		9.22	81.16	11/9/2007
GW-34SR	89.13		8.02	81.11	11/9/2007
GW-35S	88.51		7.81	80.70	11/9/2007
GW-39	83.64		3.75	79.89	11/9/2007
GW-42S	84.18		3.41	80.77	11/9/2007
GW-55S	81.70		2.99	78.71	11/9/2007
GW-55D	81.95		3.36	78.59	11/9/2007
GW-76S	88.45	TOC	7.62	80.83	11/9/2007
GW-78S	84.89		4.46	80.43	11/9/2007
GW-79S	81.54		4.51	77.03	11/9/2007
GW-201S	83.29		4.81	78.48	11/9/2007
GW-202S	86.97		6.51	80.46	11/9/2007
GW-202D	86.52		8.95	77.57	11/9/2007
GW-CA1	88.01		7.21	80.80	11/9/2007
PZ-16RR/IN	79.07		2.93	76.14	11/9/2007
PZ-16RR/OUT	79.07		2.94	76.13	11/9/2007
PZ-17RR/IN	79.50		2.04	77.46	11/9/2007
PZ-17RR/OUT	79.50		3.36	76.14	11/9/2007
PZ-18R/IN	82.42		1.99	80.43	11/9/2007
PZ-18R/OUT	82.42		1.90	80.52	11/9/2007
PZ-24	89.43		8.27	81.16	11/9/2007
PZ-25	88.90		8.81	80.09	11/9/2007

#### Notes:

TOC - Water level measurement taken from Top of Casing, not Top of Riser. **Bold Text** indicates location sampled during current Quarterly events.

Prepared by: DLC Checked by: KJC

Table 5
Surface Water Analytical Program
Slurry Wall/Cap Monitoring Program
Fourth Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Ammonia-Nitrogen	LAC 107-06-1	0.10	mg/L
Nitrate	EPA 300.0	0.050	mg/L
Nitrite	EPA 300.0	0.010	mg/L
Chloride	EPA 300.0	1.0	mg/L
Specific Conductivity	SM18 2510B	1.0	µmhos/cm
Sulfate	EPA 300.0	2.0	mg/L
Total Metals			
Aluminum, Total	SW846 6010B	100	μg/L
Chromium, Total	SW846 6010B	5.0	μg/L
Sodium, Total	SW846 6010B	2000	μg/L
Filtered Metals			
Aluminum, Filtered	SW846 6010B	100	μg/L
Chromium, Filtered	SW846 6010B	5.0	μg/L
Sodium, Filtered	SW846 6010B	2000	μg/L

Notes: Prepared by: DLC 11/20/07 mg/L - milligrams per liter Checked by: KJC 12/19/07

µmhos/cm - micromhos per centimeter

μg/L - micrograms per liter

PZ-17RR, PZ-17RR Duplicate, PZ-16RSW were not analyzed for nitrate or nitrite.

# Table 6 Final Field Parameters for Surface Water Sampling Slurry Wall/Cap Monitoring Program Fourth Quarter 2007 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Surface Water Samples							
Location	ISCO1	PZ-16RR	PZ-17RR	SD-17	PZ-18R	ISCO2	ISCO3
Date	11/12/2007	11/12/2007	11/12/2007	11/12/2007	11/12/2007	11/12/2007	11/12/2007
Depth of Water (ft)	2	0.2	0.5	0.3	2	0.4	1.0
pH (standard units)	5.93	6.04	5.95	5.56	6.22	6.91	6.58
Conductivity (µmhos/cm)	547	1620	1720	1930	620	1420	589
Dissolved oxygen (mg/L)	3.59	5.35	4.23	7.61	1.03	12.4	13.12
Temperature (°Celcius)	5.49	6.65	7.11	7.42	5.81	4.88	6.3
Redox (millivolts)	60	154	155	180	-9	29	75

Notes:

ft - feet

µmhos/cm - micromhos per centimeter

mg/L - milligram per liter

Prepared by: MH 12/19/07

Checked by: KJC 12/19/07

Table 7
Sediment Analytical Program
Slurry Wall/Cap Monitoring Program
Fourth Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Physical/Inorganic Parameters			
Percent Moisture	EPA 160.3	1.0	Percent
Metals			
Aluminum	SW846 6010B	2.5	mg/Kg
Chromium	SW846 6010B	0.50	mg/Kg
Iron	SW846 6010B	5.0	mg/Kg

Prepared by:

Checked by:

KJC 12/20/07

MJM 12/20/07

Notes: mg/Kg - milligrams per kilogram

Table 8
Groundwater Sampling Locations
Plant B Monitoring Program
Fourth Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Ground Water
B-03
GW-13
GW-16
GW-101
IW-6
IW-10

**Bolded** locations - samples were also collected for field duplicates and MS/MSD.

Prepared by: KJC 12/19/07 Checked by: BJR 12/19/07

# Table 9 Groundwater Laboratory Analytical Program Plant B Monitoring Program Fourth Quarter 2007 Sampling Event Olin Chemical Superfund Site Wilmington, Massachusetts

Analyte	Analysis Method	Detection Limit	Units
Volatile organic compounds (VOC)			
2,4,4-Trimethyl-1-pentene	SW846 8260B	1	μg/L
2,4,4-Trimethyl-2-pentene	SW846 8260B	1	μg/L
Semivolatile organic compounds (SVOC)			
N-nitrosodiphenylamine	SW846 8270C	5.1	μg/L
bis(2-ethylhexyl)phthalate	SW846 8270C	5.1	μg/L
Volatile Petroleum Hydrocarbons (VPH)			
C5-C8 Aliphatics	MA VPH	100	μg/L
C9-C12 Aliphatics	MA VPH	100	μg/L
C9-C10 Aromatics	MA VPH	100	μg/L
C5-C8 Aliphatics, Unadjusted	MA VPH	100	μg/L
C9-C12 Aliphatics, Unadjusted	MA VPH	100	μg/L
C9-C10 Aromatics, Unadjusted	MA VPH	100	μg/L
Methyl-tert-butyl-ether (MTBE)	MA VPH	5	μg/L
Benzene	MA VPH	5	μg/L
Ethylbenzene	MA VPH	5	μg/L
m,p-Xylene	MA VPH	10	μg/L
o-Xylene	MA VPH	5	μg/L
Naphthalene	MA VPH	10	μg/L
Physical/Inorganic Parameters			
Ammonia-Nitrogen	LAC 107-06-1	0.10	mg/L
pH	SM18 4500 H+ B	0.100	SU
Filtered Metals			
Iron, Filtered	SW846 6010B	9-Apr	μg/L

Notes: Prepared by: DLC  $\mu$ g/L - micrograms per liter Checked by: KJC

 $\mu g/L$  - micrograms per liter mg/L - milligrams per liter

SU - standard units

Table 10
Final Field Parameters for Groundwater Sampling
Plant B Monitoring Program
Fourth Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

Quarterly Plant B Monitoring	y Wells
Location	GW-16
Date	11/15/2007
Depth to Water (ft)	12.24
pH (standard units)	5.10
Conductivity (µmhos/cm)	161
Dissolved oxygen (mg/L)	4.63
Temperature (°Celcius)	16.9
Redox (millivolts)	95

Annual Plant B Monitoring	Wells				
Location	B-03	GW-101	GW-13	IW-10	IW-6
Date	11/15/2007	11/15/2007	11/15/2007	11/15/2007	11/15/2007
Depth to Water (ft)	13.35	12.60	13.94	12.79	12.12
pH (standard units)	5.91	6.50	4.48	5.84	6.46
Conductivity (µmhos/cm)	241	1,190	36	346	1640
Dissolved oxygen (mg/L)	4.06	2.41	0.70	<0.1	0.74
Temperature (°Celcius )	15.80	14.59	15.08	15.56	14.27
Redox (millivolts)	152	-91	29	-5	-81

 Notes:
 Prepared by:
 DLC 11/19/07

 ft - feet
 Checked by:
 KJC 12/20/07

µmhos/cm - micromhos per centimeter

mg/L - milligram per liter

Table 11
Synoptic Groundwater Elevations
Plant B Monitoring Program
Fourth Quarter 2007 Sampling Event
Olin Chemical Superfund Site
Wilmington, Massachusetts

WELL/	Reference	Notes	Depth To	Depth to	Product	Corrected	Measured
SG- ID	Elevation	Notes	Water	Product	Thickness	Elevation (1)	Date
I.D.	(ft msl)		(ft)	(ft)	(ft)	(feet NGVD)	
B-2	90.48		12.48	NPD	NA	78.00	11/9/2007
B-3	90.32		12.37	NPD	NA	77.95	11/9/2007
B-5R	91.38		12.91	NPD	NA	78.47	11/9/2007
B-7A	88.81		9.65	NPD	NA	79.16	11/9/2007
B-17	91.55		11.18	NPD	NA	80.37	11/9/2007
GW-13	90.57		12.41	NPD	NA	78.16	11/9/2007
GW-14	88.70		10.43	NPD	NA	78.27	11/9/2007
GW-15	90.01		10.72	NPD	NA	79.29	11/9/2007
GW-16	91.21		11.39	NPD	NA	79.82	11/9/2007
GW-23	91.04		13.44	13.36	0.08	77.68	11/9/2007
GW-52S	87.95		9.86	NPD	NA	78.09	11/9/2007
GW-100	90.15		12.36	NPD	NA	77.79	11/9/2007
GW-101	90.14		12.58	NPD	NA	77.56	11/9/2007
GW-102	89.00		11.26	NPD	NA	77.74	11/9/2007
IW-1	90.71		12.81	NPD	NA	77.90	11/9/2007
IW-2	90.53		12.76	12.75	0.01	77.78	11/9/2007
IW-3	90.76		12.79	12.78	0.01	77.98	11/9/2007
IW-6	89.15		11.61	NPD	NA	77.54	11/9/2007
IW-7	90.10		12.62	NPD	NA	77.48	11/9/2007
IW-8	89.94		12.51	NPD	NA	77.43	11/9/2007
IW-9	89.78		12.20	NPD	NA	77.58	11/9/2007
IW-10	90.43		12.61	NPD	NA	77.82	11/9/2007
IW-11	89.92		CNG	CNG	NA	CNG	11/9/2007
IW-12	90.31		CNG	CNG	NA	CNG	11/9/2007
IW-13	89.90		16.09	NPD	NA	73.81	11/9/2007
PID	89.97		12.62	NPD	NA	77.35	11/9/2007
P5	90.45		12.86	12.84	0.02	77.61	11/9/2007
12-IN	89.84		11.95	11.92	0.03	77.92	11/9/2007
SG	79.25						11/9/2007

Notes: Prepared by: DLC 11/19/07 TOC - Water level measurement taken from Top of Casing, not Top of Riser. Checked by: KJC 12/20/07

NPD - No Product Detected

NA - Not Applicable

Trace - Less than one-hundredth of a gallon

Dry - Water not present

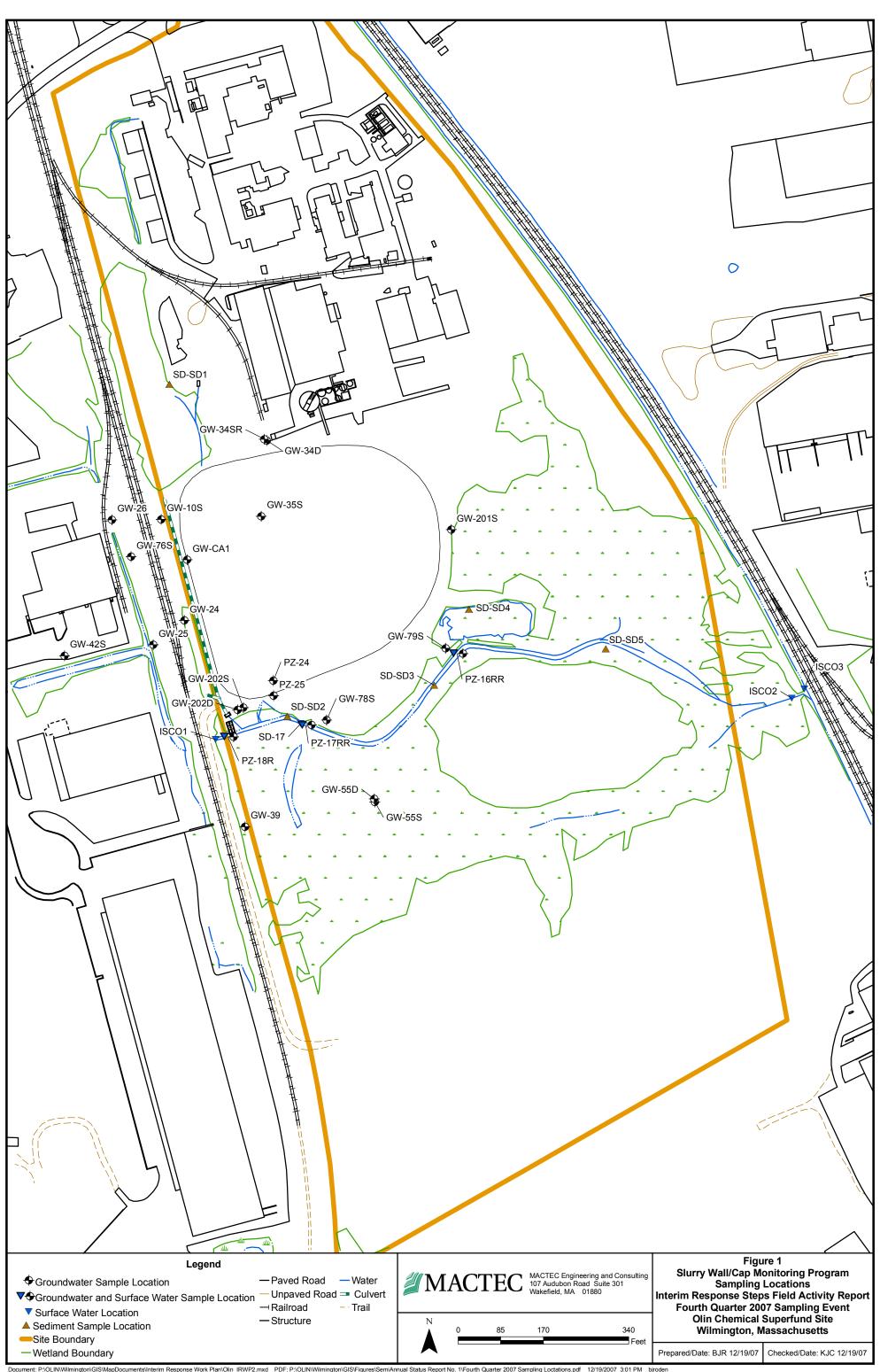
CNG - Wells have been winterized and inaccessible to measurement

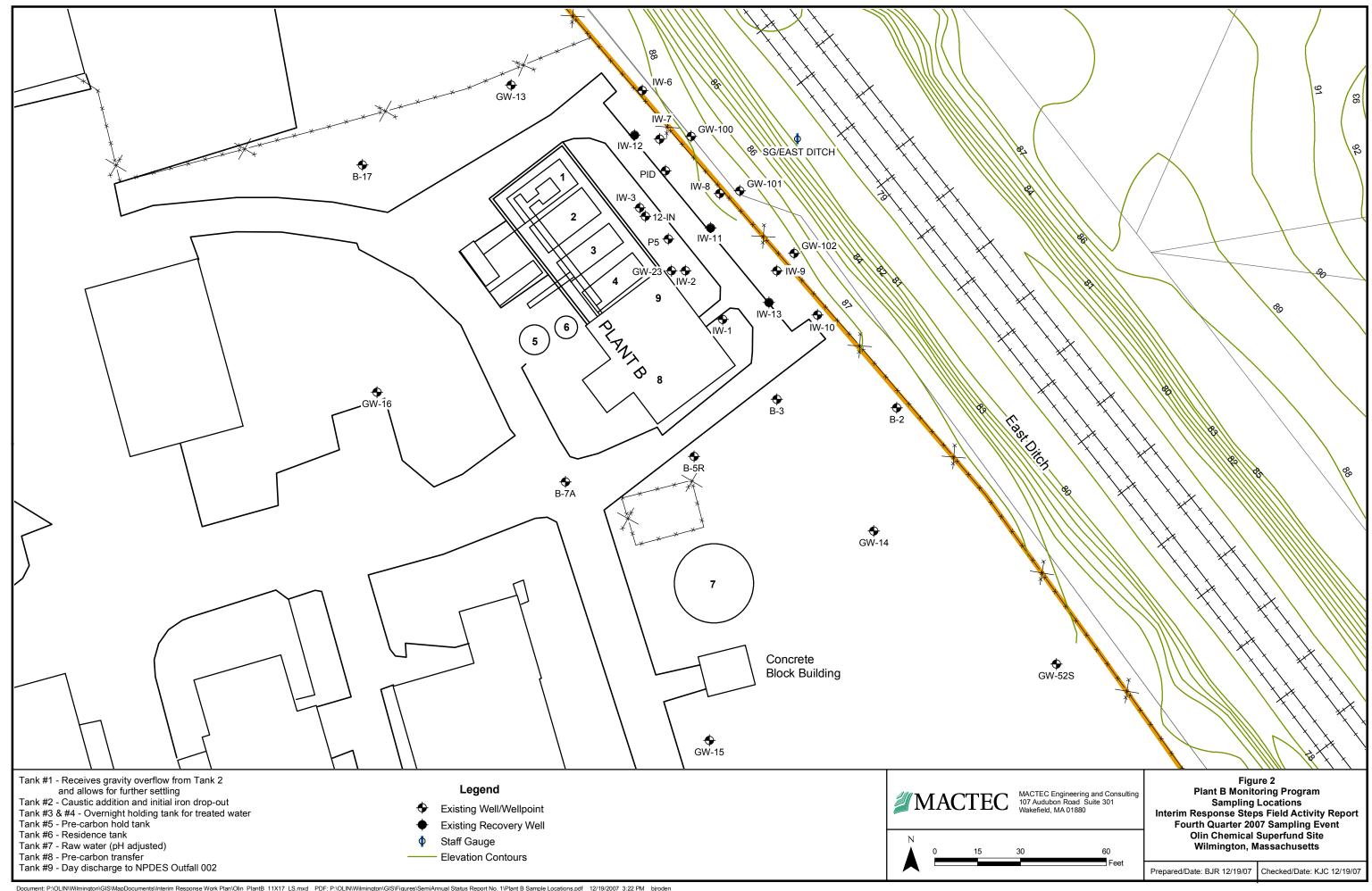
(1) Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))

**Bold Text** indicates location sampled during current Quarterly events.

Interim Response Steps Field Activity Report, Fourth Quarter 2007 Sampling Event MACTEC Engineering and Consulting, Inc. Project No. 6300060010-81.17

# **FIGURES**







## **APPENDIX A**

# Field Data Records and Field Instrument Calibration Records

Table 3 PCMP Synoptic Groundwater Elevations Third Quarter, August 2007 Olin Chemical Superfund Site Wilmington, Massachusetts

WELL/ SG-ID	Reference Elevation	Notes	Depth To Water	Corrected Elevation	Measured Date
I.D.	(ft msl)				
GW-10S	89.10	701	8=12	_	
GW-24	83.43		2.69	-	
GW-25	85,97	Feet.	8A24		
GW-26	84.93	4+13	4.13	-	
GW-34D	90.38		9.22		
GW-34SR	89.13		8.02		
GW-35S	88.51		18.5		
GW-39	83.64		5:15	-	
GW-42\$	84.18	17.44 TO	3.41	***	
GW-55S	81.70		2.99	_	
GW-55D	81.95		3.36	-	
GW-76S	88.45	TOC	7.62	-	
GW-78S	84.89		4.46		
GW-79S	81.54		4.51		
GW-201S	83.29		4.81		
GW-202S	86.97		6.51		
GW-202D	86.52		5 995	1000	
GW-CA1	88.01		7.21	-	
PZ-16RR/IN/	79.07		1.93/2	- MP.	
PZ-17RR/IN/		2	1.04/3	.36-	
PZ-18R/IN/	82.42		1.23/1		
PZ-24	89.43		8.27		
PZ-25	88.90		8.81		

TOC - Water level measurement taken from Top of Casing, not Top of Riser. Bold Text indicates location sampled during current Quarterly event.

> Prepared by: DUC Checked by:

world-levels measured 11/9/07

Table 3 51 Earnes Street, Wilmington, Massachusetts Plant B Synoptic Ground Water Level Elevations Fourth Quarter, November 2005

Well ID Depth to Water (II) (2)			Depth to Product (ff) (3)			Product Thickness (ft) (5),(4)			Reference Elevation (ff) (6)	Potentio	Potentiometric Surface Elevation (feet NGVD) corrected (5)			Product Removed (gallons) (1)			Well ID					
DATE	11/4/0-	+ .	oil		1/0/1900	1/0/1900	1/0/1900	1/0/1900	1/0/1900	1/0/1900	1/0/1900	1/0/1900	feet	1/0/1900	1/0/1900	1/0/1900	1/0/1900	1/0/1900	1/0/1900	1/0/1900	1/0/1900	Well
B-2	IZ-ME				NPD	NPD	NPD	NPD	NA	NA	NA	NA	90,48	90.48	90.48	90.48	90,48					8-2
B-3	12.37				NPD	NPD	NPD	NPD	NA	NA	NA	NA	90.32	90.32	90.32	90.32	90.32					8-3
B-5R	12.91				NPD	NPD	NPD	NPD	NΛ	NA.	NA	NA	91.38	91,39	91.38	91.38	91,38					8 58
B-7A	9.66				NPD	NPD	NPD	NPD	NA	NA	NA	NA	88.81	88.81	88.81	88.81	***					B-7A
B-17	11.18	2			NPD	NPD	NPD	NPD	NA	NA	NA	NA	91.55	91.55	91.55	91.55	91.55					8-17
3W-136	12.41				NPD	NPD	NPD	NPD	NA	NA	NA	NA	90.57	90.57	90.57	90.57	90.57					GW-13
GW-14	10.47	9		-	NPD	NPD	NPD	NPD	NA	NA	NA	NA	58.70	88.70	88.7	88.70	88.70					GW-14
	1072		-		NPD	NPD	NPD	NPD	NA	NA	NA	NA	90.01	90.01	90.01	90.01	90,01					GVA-15
	11,37				NPD	NPD	NPD	NPD	NA	NA	NA	NA	91.21	91.21	91.21	91.21	91.21					GW-18
GW-23	15.44	1	5.36		13.85	13.38	13.60	13,55	-13,85	-13.38	-13.60	-13.55	01.04	77.88	78.320	78.03	78.17					GW-2
W-525		-			NPD	NPD	NPD	NPD	NA	NA	NA	NA	87.95	87.95	87.95	87.95	87.95					GW-52
SW-100	1Z. 36				NPD	NPD	NPD	NPD	NA	NA	NA	NA	90,15	90.15	90.15	90.15	90.15					GW-10
SW-101	12.58				NPD	NPD	NPD	NPD	NA	NA	NA	NA	90.14	90.14	90.14	90.14	90.14					GW-10
3W-102	11.26		*******		NPD	NPD	NPD	NPD	NA	NA	NA	NA	89.00	89.00	89.00	89.00	89.00					GW-10
BW-1				- 16		NPD	NPD	NPD	NA	NA	NA	NA	90.71	90.71	90.71	90.71	90.71					IW-1
IW-2	13:46	1	4.75	1Z.78	NPD	NPD	NPD	NPD	NA	NA	NA	NA	90.53	90.53	90.53	90.53	90.53					IVV-2
IVV-3	12.34	c	701		NPD	NPD	NPD	NPD	NA	NA	NA	NA	90.76	90.76	00.76	00.76	90.76					NV-3
IW-6	11.61				NPD	NPD	NPD	NPD	NA	NA	NA	NA	89.15	89.15	89.15	89.15	89.15					IW-6
IW-76	12-62				NPO	NPD	NPD	NPD	NA	NA	NA	NA	90.10	90.10	90.1	90.10	90.10					IVV-7
IW-8	12.51	-			NPD	NPD	NPD	NPD	NA	NA	NA	NA	89.94	89.94	89.94	89.94	89.94					IW-8
IW-96	12.20				NPD	NPD	NPD	NPD	NA	NA	NA	NA	89.78	89.78	89.78	89.78	89.78					NV-9
IW-10 <sup>E</sup>	12.61	-			NPD	NPD	NPD	NPD	NA	NA	NA.	NA	90.43	90.43	90.43	90.43	90.43				-	IW-10
W-11					CNG	NPD	NPD	NPD	CNG	NA NA	NA NA	NA.	89.92	CNG	89.92	89.92	89.92					
W-12			4 Oil		CNG	NPD	NPD	NPD	CNG	NA NA	NA NA	NA.	90.31	CNG	90.31	90.31	90.31					IW-11
W-13	PR London	**	. 1 .		CNG	17.19	NPD	NPD	CNG	-17.19	NA NA	NA.	89.90	CNG	73.57	89.90	89.90					IVV-13
PID	12.62		-		NPD	NPD	12.90	NPD	NA	NA NA	-12.90	NA NA	89.97	89.97	89.97	77.72	89.97					PID
P5	12.86	1	2.84		13.56	12.85	13.05	12.99	-13.56	-12.85	-12,90	-12.99	90.45	77.57	78.2425	78.05	73.11					PS PS
12-IN					NPD	NPD	NPD	NPD	-13.50 NA	NA	NA NA	-12.99 NA	89.84	89.84	89.84	89.84	89.84					12-IN
SG	11.42	-> 4	. 75		NPD	NPD	NPD	NPD	NA	NA NA	NA	NA NA	79.25	79.25	79.25	79.25	79.25					SG SG

NPD - No Product Detected; NA - Not Applicable; Trace - Less than one-hundredth of a gallon; DRY - Water not present; CNG - Wells have been winterized and inaccessible to measurement

Ground water and product elevation data and oil removed collected by Olin.
 Measurement collected from top of PVC. If well does not have PVC casing, measurement from top of steel casing.
 Collected using Solinst brand oil/water interface probe.

- Sheens noted at wells are assigned a product thickness of 0.01 feet.

-Correction equation used: Reference elevation - (depth to water - (product thickness X 0.95))
 Now top of casing reference elevations surveyed by Dana Perkins 4/38-5/38. Other wells resurveyed 11/07 following upgrades and repairs.
 -Staff guage has been replaced and resurveyed by DFP 10/28/2004.

Prepared by: KJC MC Checked by: JCN

FIELD INSTRUMENTA	ATION CALIBR	ATION REC	ORD L	MACTEC Engir	ineering and Consulting
PROJECT Olin Simi	Annual Samples	7	DATE	11 13 0	7
CREW ID OR TASK ID	1.		JOB NUMBER		
SAMPLER SIGNATURE	1+6			-	
EQUIPMENT CALIBRATION		ALIBRATION INFO	RMATION	AC	CCEPTANCE
7.7	STANDARD VAI		METER VALU		RITERIA **
HORIBA MODEL NO. 1-2-2	pH 4,00		pH 4.00	units	+/- 10% of standard
UNIT ID NO. MO16-15 Sp. 0		mS/cm Sp. Cond	With William State	mS/cm	+/- 10% of standard
	Redox		Redox	— <sup>m∨</sup>	see note 1
	DO	mg/L.*	DO 11.15	mg/L	+/- 10% of standard
Thermometer I	Temperature	deg. C Tempo	perature	deg. C	+/- 2.0 deg. C
TURBIDITY METER TYPE		NTU (low		NTU	within 0.3 NTU of
MODEL NO			04		the standard
UNIT ID NO	24.5 = -1.5	NTU (high	)	NTU	+/- 10% of standard
PHOTOIONIZATION					
METER TYPE	Backgroundppmv	Zero Airpp	omv Meter	ppmv	within 5 ppmv of Zero
MODEL NO	Span Gas		Meter		+/- 10% of standard
UNIT ID NO	0 0		V-2-2-42	30,000	
OTHER METER TYPE		== <u></u>			see note 2
MODEL NO	S.				see note 2
UNIT ID NO				HEAR	see note 2
OTHER METER TYPE					see note 2
MODEL NO					see note 2
UNIT ID NO			-		see note 2
MATERIALS RECORD	<u>D</u>	-	Calibration Fluids/		
Deionized Water Source:			Standard Source:		
Trip Blank Water Source:	<del></del>	t	_ot Numbers pH		
Sample Preservatives Source:					
Disposable Filter Type:					
Other			Turb		
NOTES:					
* = Indicate in notes section what was used as	the DO standard (i.e. hased o	and realize at room tem			
** = If the meter reading is not within acceptan				Lia If project regi	Tanana arata
necessitate use of the instrument, clearly  1 = meter must read within specified range of	document on all data sheets and	d log book entries that the			
1 = meter must read within specified range of the specify acceptance criteria in the Notes se		H- 10 mv @ 25 aeg C <sub>J</sub> .			

FIELD INSTRUMENTATION CALIBRATION RECORD MACTEC Engineering and Consulting
PROJECT OILM, WILMINGTON DATE 1113107
CREW ID OR TASK ID 81.17 JOB NUMBER 6300060010
SAMPLER SIGNATURE
EQUIPMENT CALIBRATION CALIBRATION INFORMATION ACCEPTANCE  STANDARD VALUE METER VALUE CRITERIA **
HORIBA MODEL NO. U-ZZ pH 4.00 units pH 4.00 units +/- 10% of standard UNIT ID NO. MO15-07 Sp. Conductivity 4.49 mS/cm wV see note 1  DO mg/L* DO 7.93 mg/L +/- 10% of standard mg/L +/- 10% of standard deg. C Temperature 17.65 deg. C +/- 2.0 deg. C
TURBIDITY METER TYPE 13 ach CO. NTU (low) O.Z.S NTU within 0.3 NTU of the standard
JNIT ID NO. NOZ4-18 800 NTU (high) 789 NTU +/- 10% of standard
PHOTOIONIZATION           METER TYPE
OTHER METER TYPE         see note 2           MODEL NO.         see note 2           UNIT ID NO.         see note 2
OTHER METER TYPE         see note 2           MODEL NO.         see note 2           UNIT ID NO.         see note 2
MATERIALS RECORD         Lot Number         Calibration Fluids/           Deionized Water Source:         Standard Source:           Trip Blank Water Source:         Lot Numbers         pH           Sample Preservatives Source:         mV           Disposable Filter Type:         Sp. Cond.           Other         Turb.
NOTES:
*= Indicate in notes section what was used as the DO standard (i.e., based on saturation at room temperature)  **= If the meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if available. If project requirements necessitate use of the instrument, clearly document on all data sheets and log book entries that the specified parameter was not calibrated to the acceptance criteria.  1 = meter must read within specified range of the Zobell solution (usually 231 +/- 10 mv @ 25 deg C).  2 = specify acceptance criteria in the Notes section

FIELD INSTRUMENTATION CALIBRATION RECORD	MACTEC Engineering and Consulting
PROJECT DATE	11 14 07
CREW ID OR TASK ID JOB NUMBER	
SAMPLER SIGNATURE 46 LUC	_
EQUIPMENT CALIBRATION CALIBRATION INFORMATION	ACCEPTANCE
STANDARD VALUE   METER VAL	units +/- 10% of standard
PHOTOIONIZATION	
	ppmv within 5 ppmv of Zero
	ppmv +/- 10% of standard
UNIT ID NO	Print to the second
OTHER METER TYPE	see note 2
MODEL NO	see note 2
UNIT ID NO	see note 2
OTHER METER TYPE	see note 2
MODEL NO	see note 2
UNIT ID NO	see note 2
MATERIALS RECORD Lot Number Calibration Fluids/	
Deionized Water Source: Standard Source:	
Trip Blank Water Source: Lot Numbers pH	
	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )
Other Turb.  NOTES:	
<ul> <li>= Indicate in notes section what was used as the DO standard (i.e., based on saturation at room temperature)</li> <li>= If the meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if availancessitate use of the instrument, clearly document on all data sheets and log book entries that the specified parameter was 1 = meter must read within specified range of the Zobell solution (usually 231 +/- 10 mv @ 25 deg C).</li> <li>2 = specify acceptance criteria in the Notes section</li> </ul>	

FIELD INSTRUMENTATION CALIBRATION RECORD	MACTEC Engineering and Consulting
PROJECT Olin, wilmington DAT	E 11114107
A1 17	
JOB NOMBER	( 22-32-10
SAMPLER SIGNATURE	
EQUIPMENT CALIBRATION CALIBRATION INFORMATION	ACCEPTANCE
STANDARD VALUE METER V	
HORIBA MODEL NO. U-ZZ pH H. OO units pH H. OJ	
UNIT ID NO. MO15 -07 Sp. Conductivity 4.49 mS/cm Sp. Conductivity 4.54	
Redox mV Redox 171	
DO mg/L* DO 10 · 8	SSECTION AND ADDRESS OF THE PARTY OF THE PAR
Thermometer Temperaturedeg. C Temperature	deg. C +/- 2.0 deg. C
TURBIDITY METER TYPE Hach - 40. ( NTU (low) 0.2	NTU within 0.3 NTU of
MODEL NO. ZIOCT	the standard
UNIT ID NO. 4024-18	NTU +/- 10% of standard
PHOTOIONIZATION	
METER TYPE Backgroundppmv Zero Airppmv Meter	ppmv within 5 ppmv of Zero
AND SECURITION OF THE PROPERTY	ppmv +/- 10% of standard
UNIT ID NO	
OTHER METER TYPE	see note 2
MODEL NO	see note 2
UNIT ID NO	see note 2
OTHER METER TYPE	see note 2
MODEL NO	see note 2
UNIT ID NO	see note 2
MATERIALS RECORD Lot Number Calibration Fluids/	
Deionized Water Source: Standard Source:	
	pH
	nV
	nd
Other1U	rb
NOTES:	
	*1
* = Indicate in notes section what was used as the DO standard (i.e., based on saturation at room temperature)	
** = If the meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if a	vailable. If project requirements
necessitate use of the instrument, clearly document on all data sheets and log book entries that the specified parameter 1 = meter must read within specified range of the Zobeli solution (usually 231 +/- 10 mv @ 25 deg C).	
2 = specify acceptance criteria in the Notes section	

FIELD INSTRUMENTATION CALIBRATION RECORD MAC	CTEC Engineering and Consulting
PROJECT Olin, wilming Ten DATE	1/15/07
CREW ID OR TASK ID JOB NUMBER 6	30060010
SAMPLER SIGNATURE	
EQUIPMENT CALIBRATION CALIBRATION INFORMATION STANDARD VALUE METER VALUE	ACCEPTANCE
STANDARD VALUE METER VALUE  HORIBA MODEL NO. U - ZZ PH 4.00 units PH 4.00 u	units +/- 10% of standard
LIMIT IS NO. Market and	mS/cm +/- 10% of standard
The control of the co	mV see note 1
	mg/L +/- 10% of standard
	deg. C +/- 2.0 deg. C
N N N N N N N N N N N N N N N N N N N	NTU within 0.3 NTU of
MODEL NO. 2100	the standard
UNIT ID NO. MOZU-18 8-0 NTU (high) 339 N	NTU +/- 10% of standard
PHOTOIONIZATION	
METER TYPE Thermo Background ppmv Zero Air ppmv Meter	ppmv within 5 ppmv of Zero
MODEL NO. 580 B CV M Span Gas 100 ppmv Meter 101.6	
UNIT ID NO. MOCI - CO	100 00000000
OTHER METER TYPE	see note 2
MODEL NO	see note 2
UNIT ID NO	see note 2
OTHER METER TYPE	see note 2
MODEL NO	see note 2
UNIT ID NO	see note 2
MATERIALS RECORD <u>Lot Number</u> Calibration Fluids/	
Deionized Water Source: Standard Source:	
Sample Preservatives Source: mV_	
Vietness and the second	
OtherTurb	
NOTES:	
* = Indicate in notes section what was used as the DO standard (i.e., based on saturation at room temperature)	==
*= indicate in notes section what was used as the DO standard (i.e., based on saturation at room temperature)  ** = If the meter reading is not within acceptance criteria, clean or replace probe and re-calibrate, or use a different meter if available. If	f-art-ut as quite grants
necessitate use of the instrument, clearly document on all data sheets and log book entries that the specified parameter was not ca	
1 = meter must read within specified range of the Zobell solution (usually 231 +/- 10 mv @ 25 deg C).	interes to the consensus the time
2 = specify acceptance criteria in the Notes section	

MACTEC ENGINEERING AND CONSU	LTING		PAGE OF
FIELD DATA RECORD - SUR	FACE WATER/ SEDIME	NT SAMPLING	**************************************
PROJECT Olin Chemical Superfund Site	JOB N	JMBER 630000010	DATE 11/16/07
FIELD SAMPLE NUMBER 55.50	ACTIVITY TIME	START 4:40 END 4:50	Sample Time
DC SAMPLES COLLECTED Y	M5, M5D	sampled as q:us	
SURFACE WATER DATA		EQUIPMENT USED TYPE OF SURFACE	WATER
WATER DEPTH AT LOCATION FT	SPEC. COND ms/CN	BEAKER/Bottle STREAM/RI	and the second second
DEPTH OF SAMPLE FROM SURFACE FT	D.O. PPM	PERISTALTIC PUMP SEEP	POTABLE WATER
TEMPERATURE	SALINITY	FILTER/ NUMBER MARSH	
DEG C	PPM	OTHER OTHER	1
TURBIDITY	ORP mV		
PH UNITS Associated field	Dup	Equip BLK . MS/M	ISD: Yes
SEDIMENT DATA			147
DEPTH OF SEDIMENT	TYPE OF CERTIFIER.		mosty organt
TYPE OF SAMPLE DISCRETE	TYPE OF SEDIMENT: ORGANIC	EQUIPMENT FOR COLLECTION DECON FLUIDS USED  HAND CORER  DI WATER	SITY Sara.
	SAND	S.S. SPOON POTABLE WATER	40.45% -rga
SAMPLE OBSERVATIONS	GRAVEL	Shovel-Trowel	30.35 % Seve
ODOR ~/A	CLAY	DREDGE OTHER	- SOUNOTIES
COLOR dark brown	* TALCOSE	OTHER	dark brown
gra		To the second se	9
Associated field Dup 59-59	adolp Dairt	MS/MSD: Yes	
ANALYTICAL PARAMETERS WATER	METHOD	PRESERVATION VOLUME	
□ voc	NUMBER FILTERED 8260	METHOD REQUIRED Notes:	546
svoc	8270	4°C 2 X 1L AG	¥
NDMA TAL METALS	EPA 1625 6000/7000	Na2S2O3 4° c 2 X 1L AG pH<2 HNO3 4° c 1 500 mL poly	3 4
Hex-Chromium	3060A/7196A	pH<2 HNO3 4° c 1 500 mL poly 4° C no Headspace 1 500 mL poly no Headspace	
opex-kempore	mod 8000	4°c 3X 40 mL vial	
吕 ———		Wilder Wilder	#
ANALYTICAL PARAMETERS SOIL	METHOD	PRESERVATION VOLUME Notes:	
□ voc	NUMBER 8260	METHOD REQUIRED	3A
Svoc	8270	DI and MEOH 2-low (DI) & 1-high (MEOH) 4*c 18 oz	
NDMA	mod 8270	4°C 18 0Z	PROPERTY OF THE PROPERTY OF TH
TAL METALS	6000/7000	4° c 1 4 oz	THE STATE OF THE S
Hex-Chromium	3060A/7196A	4'C 14 oz	
H			
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NOTES			
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		SIGNATURE:	
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MACTEC ENGINEERING AND CONS	III TING		
FIELD DATA RECORD - SUI		NT SAMPLING	
PROJECT Ofin Chemical Superfund Site		UMBER 34:024 0010 81.17 DATE 11 16 07	
FIELD SAMPLE NUMBER 50 -		START /012 END Sample Time /015	
OC SAMPLES COLLECTED N/A			
SURFACE WATER DATA		EQUIPMENT USED TYPE OF SURFACE WATER	
WATER DEPTH AT LOCATION =T	SPEC. COND m5/CN	3EAKER/Bolth STREAM RIVER DECON FLUIOS USED	D:
DEPTH OF SAMPLE	D.D.	PACS BOMB LAKE/ POND DI WATER	
FROM SURFACE FT TEMPERATURE	SALINITY	PERISTALTIC PUNP SEEP POTABLE WATER	
DEG C	PPM	FILTER/ NUMBER MARSH OTHER	-
TURBIDITY	ORP		
PH UNITS Associated fie	ld Dup	Equip BLK MS/MSD; Yes	
SEDIMENT DATA			
DEPTH OF SEDIMENT / O	TYPE OF SEDIMENT:	EQUIPMENT FOR COLLECTION DECON FLUIDS USED	
TYPE OF SAMPLE DISCRETE	V ORGANG	HAND CORER DI WATER	
COMPOSITE	XISAND	X S.S. SPOON POTABLE WATER	
SAMPLE DESERVATIONS	GRAVEL	Shovel-Travel   K Liquinox	
ODOR Decemposition	Cuy	OREOGE OTHER	
COLOR BLACK / GALL	TALCOSE	OTHER SS-1/0 Shad	
COCOR 10/11/11/11	OTHER	35 % 3 And 35 = 14 5.17 SATISTE	d
Associated field Dup N/A	Equip BLK A	//A MS/AISD: Yes	
ANALYTICAL PARAMETERS	The state of the s	1500	
WATER	NUMBER FILTERED 8260	PRESERVATION VOLUME METHOD REQUIRED Notes:	
Svoc	8270	pH<2 HCL 4° c 3 X 40 mL 4° c 2 X 1L AG	
NDMA NDMA	EPA 1625	NazSzO3 4°c 2 X tL AG	
TAL METALS	6000/7000	pH<2 HNO3 4° c 1 500 mL poly	
Hex-Chromium	3060A/7196A	4° C no Headspace 1 500 mL poly no Headspace	
opex-kempore	mod 8000	4° c 3X 40 mL vial	
ANALYTICAL PARAMETERS	7/02/2020	Company of the compan	
SOIL VOC	METHOD NUMBER 8260	PRESERVATION         VOLUME         Notes;           METHOD         REQUIRED           DI and MEOH         2-low (DI) & 1-bigh (MEOH)	
□ svoc	8270	4°c 13 oz	
NDMA	mod 3270	4°c 18 oz	
TAL METALS	6000/7000	4°c 14 oz	
Hex-Chromium	3060A/7196A	4°C 1402	
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MACTEC ENGINEERING AND CONSULTING PAGE _ L OF	ı
FIELD DATA RECORD - SURFACE WATER/ SEDIMENT SAMPLING	7
PROJECT Olin Chemical Superfund Site JOB NUMBER 6300600 C DATE 11/16/07	
FIELD SAMPLE NUMBER 50-503 ACTIVITY TIME START 10:25 END 10:35 Sample Time 10:3	þ
QC SAMPLES COLLECTED	
SURFACE WATER DATA EQUIPMENT USED TYPE OF SURFACE WATER	
WATER DEPTH SPEC. COND BEAKER/Bottle STREAM RIVER DECON FLUIDS US AT LOCATION FT	SED:
DEPTH OF SAMPLE D.O. PPM PERISTALTIC PUMP SEEP POTABLE WATER  DOUBLE WATER	
TEMPERATURE DEG C SALINITY PPM FILTER/ NUMBER MARSH	
TURBIDITY ORP OTHER OTHER OTHER	-
PH UNITS Associated field Dup Equip BLK MS/MSD: Yes	
SEDIMENT DATA	
DEPTH OF SEDIMENT: EQUIPMENT FOR COLLECTION DECON FLUIDS USED 357. SONO	
TYPE OF SAMPLE DISCRETE ORGANIC HAND CORER DI WATER ZC 7. 51 N  COMPOSITE SAND S.S. SPOON POTABLE WATER	
SAMPLE OBSERVATIONS  GRAVEL  Shovel-Trowel  Shovel-Trowel	
ODOR SUNUE CLAY DREDGE OTHER SOURCE	
COLOR DAT & GVOY . TALCOSE OTHER	
brow MOTHER SINT	
Associated field Dup Equip BLK MS/MSD: Yes	3
ANALYTICAL PARAMETERS WATER METHOD PRESERVATION VOLUME	
NUMBER FILTERED METHOD REQUIRED Notes:	
VOC     8260     pH<2 HCL 4° c	
□ NDMA EPA 1625 Na2S2O3 4°C 2 X 1 L AG	
TAL METALS 6000/7000 pH<2 HNO3 4°c 1 500 mL poly	
Hex-Chromium 3060A/7196A 4° C no Headspace 1 500 mL poly no Headspace	
opex-kempore mod 8000 4°c 3X 40 mL vial	1
ANALYTICAL PARAMETERS	
SOIL METHOD PRESERVATION VOLUME Notes:	
NUMBER   METHOD   REQUIRED	
SVOC 8270 4°C 18 oz	
□ NDMA mod 8270 4' c 18 oz	
TAL METALS 6000/7000 4°C 14 oz	985
Hex-Chromium 3060A/7196A 4°c 14 oz	
x 6010B meres 60108 400 14402	- 1
	- 1
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MACTEC ENGINEERING AND CONS	SULTING		PAGEOF
FIELD DATA RECORD - SU	IRFACE WATER/ SEDIM	ENT SAMPLING	
PROJECT Oim	JOB N	NUMBER	DATE 11/16/07
FIELD SAMPLE NUMBER 50-5	ACTIVITY TIME	START 1355 END 1105	BOTTLE TIME // DC
QC SAMPLES COLLECTED			
SURFACE WATER DATA		EQUIPMENT USED TYPE OF SURF	TACE WATER
WATER DEPTH	SPEC. COND		
AT LOCATION FT	SPEC. COND	PACS BOMB LAKE/F	
DEPTH OF SAMPLE FROM SURFACE FT	D.O. PPM	PERISTALTIC PUMP SEEP	POTABLE WATER
TEMPERATURE	SALINITY	FILTER/ NUMBER MARSH	
TURBIDITY DEG C	ORP PPM	OTHER OTHER	
NTUS	mV		
PH UNITS ASSOCIATED	D TRIP BLANK	RINSATE BLANK	
SEDIMENT DATA ASSOCIATED	D TRIP BLANK	RINSATE BLANK	
DEPTH OF SEDIMENT	TYPE OF SEDIMENT:	EQUIPMENT FOR COLLECTION DECON FLUIDS USED	
TYPE OF SAMPLE DISCRETE	ORGANIC	HAND CORER DI WATER N2 PUR	GE
COMPOSITE	SAND	K s.s. spoonpotable water	
SAMPLE OBSERVATIONS	GRAVEL	ALUMINIUM PAN K LIQUINOX	angeneral and T
ODOR N.IE	CLAY	DREDGEOTHER	15 % Sand
COLOR BOWN	OTHER	OTHER	25-10 515
			25-16 Sand 25-16 Sitt
ANALYTICAL PARAMETERS WATER	METHOD	PRESERVATION VOLUME SAMPI	F
	NUMBER FILTERED	METHOD REQUIRED COLLEC	
I			
ANALYTICAL PARAMETERS SOIL	METHOD	PRESERVATION VOLUME SAMPI	c
	NUMBER	METHOD REQUIRED COLLEC	
		——— <u> </u>	
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PROJECT		JOB 1	NUMBER 6300	c 600 10		DATE 11/16	107
FIELD SAMPLE NUMBER	50-505	ACTIVITY TIME	START 10:35	END 10	اسح	BOTTLE TIME 1	>:40
C SAMPLES COLLECTED							
SURFACE WATER DATA			EQUIPMENT US	ED TYPE	E OF SUPEACE I	MATER	
	SDEC COND [			D 111	E OF SURFACE V		LUDG LIGED
WATER DEPTH AT LOCATION	SPEC. COND		BEAKER		STREAM/ RIV		UIDS USED:
DEPTH OF SAMPLE FROM SURFACE	D.O.	РРМ	PACS BOMB	- DUMO	LAKE/ POND SEEP		N2 PURGE
TEMPERATURE	SALINITY		FILTER/ NUN		MARSH	POTABLE	WATER
	DEG C	РРМ	OTHER-	DEN	OTHER		-
TURBIDITY	NTUS	mV	oner		OTHER		
эн 📗		UIV J		16.00 P			
UNITS	ASSOCIATED TRIP BLANK		RINSATE BL	NK [			
Construction of the control of the c	ASSOCIATED TRIP BLANK		RINSATE BL	ANK			
DEPTH OF SEDIMENT	TYPE OF SEDIMEN		EQUIPMENT FOR COLLE	CTION DECON F	LUIDS USED	552	5117
TYPE OF SAMPLE DISCRETE		ANIC	HAND CORER	DI W	ATER N2 PURGE	-5.	
<b>∠</b> COMPOSI			S.S. SPOON		ABLE WATER	30 7.	5000
SAMPLE OBSERVATIONS	GRAN		ALUMINIUM PAN-	$\Box$	INOX	5-10%	craci
ODOR SULFUE			DREDGE	отн	ER		
COLOR STON .	C795 1907 v	Maria on construction	OTHER				
	181 ATRON	- SI17					
ANALYTICAL PARAMETERS WATER	METHO NUMBE		PRESERVATION METHOD	VOLUME REQUIRED	SAMPLE		
<u> </u>	NOMBE		<u> </u>	REGOINED	COLLECTED		
	<u> </u>				_		
	<u> </u>				- 8		
	-				=		
	*						
ANALYTICAL PARAMETERS				-	_ 凵		
SOIL	METHO		PRESERVATION	VOLUME	SAMPLE		
× 60108	mesons Gold		METHOD	REQUIRED	COLLECTED		
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MACTEC ENGINEERING AND CONSUL	TING		37	PAGE ( OF )
FIELD DATA RECORD - SURF	ACE WATER/ SEDIMEN	T SAMPLING		
PROJECT Olin Chemical Superfund Site	JOB NU	MBER		DATE 11 12 07
FIELD SAMPLE NUMBER TSCU-2		START 1550 END 161	5	Sample Time 1600
		<u> </u>		Sample vine [1800]
QC SAMPLES COLLECTED		TV-111		
SURFACE WATER DATA		EQUIPMENT USED TYPE	OF SURFACE WA	ATER
WATER DEPTH U.4 FT	SPEC. COND /.42 ms/CM	BEAKER/Bottle	STREAM RIVE	R DECON FLUIDS USED:
DEDTU OF CAMPLE		PACS BOMB	LAKE/ POND	DI WATER
FROM SURFACE U. I FT	12.4 PPM	PERISTALTIC PUMP	SEEP	POTABLE WATER
TEMPERATURE 4.88 DEG C	SALINITY - PPM	FILTER/ NUMBER	MARSH	DesicaTed Tolsing
	npp [	OTHER-	OTHER	
NTUS	21 mv	32.2		
PH 6.91 UNITS Associated field D	Dup _	Equip BLK	MS/MS0	D: Yes
SEDIMENT DATA				
			- 25	
			UIDS USED	3
TYPE OF SAMPLE DISCRETE COMPOSITE	ORGANIC	HAND CORER DI WA		
SAMPLE OBSERVATIONS	SAND GRAVEL	5 F	BLE WATER	
ODOR	CLAY	Shovel-TrowelLIQUII DREDGEOTHE	Noon M	đ
COLOR	TALCOSE	OTHER		
	OTHER			
Associated field Dup	Equip BLK	MS/MSD: Y	es	
ANALYTICAL PARAMETERS WATER	METHOD	PRESERVATION VOLUME		
□ voc	NUMBER FILTERED 8260	METHOD REQUIRED  pH<2 HCL 4°C 3 X 40 mL	Notes:	EPA 300,0
svoc	8270	4'c 2X1LAG	30	
NDMA TAL METALS	EPA 1625	Na2S2O3 4° c 2 X 1L AG		rm-18
Hex-Chromium	6000/7000 3060A/7196A	pH<2 HNO3 4" c 1 500 mL poly 4" C m Headspace 1 500 mL poly	no Headspace	Sw 846
opex-kempore	mod 8000	4°c 3X 40 mL vial		6010B
				*
			_	
ANALYTICAL PARAMETERS SOIL	METHOD	PRESERVATION VOLUME	Notes:	
□ voc	NUMBER 8260	METHOD REQUIRED DI and MEOH 2-low (DI) & 1	-high (MEOH)	
svoc	8270	4°C 18 0Z		
NDMA TAL METALS	mod 8270 6000/7000	4°C 18 oz 4°C 14 oz		*** ** ** **
Hex-Chromium	3060A/7196A	4°C 140z		
			-	
			<del></del>	
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		SIGNATURE:	, K	
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MACTEC ENGINEERING AND CONSULTING	3			PAGEOFL_
FIELD DATA RECORD - SURFAC	E WATER/ SEDIMEN	IT SAMPLING		10 TO THE RESERVE TO
PROJECT Olin Chemical Superfund Site	JOB NU	MBER		DATE 11 12 07
FIELD SAMPLE NUMBER 75(0-3			END /545	Sample Time 1545
QC SAMPLES COLLECTED -				
SURFACE WATER DATA		EQUIPMENT USED	TYPE OF SURFACE WA	ATER
	. COND . 589 ms/cm	BEAKER/Bottle	STREAM/ RIVE	R DECON FLUIDS USED:
		PACS BOMB	LAKE/ POND	DI WATER
FROM SURFACE Q. 1 FT D.O.	13.12 PPM	PERISTALTIC PUM	P SEEP	POTABLE WATER
TEMPERATURE (C.3 DEG C SALIN	PPM	FILTER/ NUMBER _	MARSH	Dedicated Tobing
TURBIDITY ORP	721	OTHER	OTHER	
PH C CU	75.4 mV			
PH C. 58 UNITS Associated field Dup		Equip BLK	MS/MSC	D: Yes
SEDIMENT DATA	¥.	79		
DEPTH OF SEDIMENT TYPE O	F SEDIMENT:	EQUIPMENT FOR COLLECTION	DECON FLUIDS USED	
TYPE OF SAMPLE DISCRETE	ORGANIC	HAND CORER	DI WATER	
COMPOSITE	SAND	S.S. SPOON	POTABLE WATER	
SAMPLE OBSERVATIONS	GRAVEL	Shovel-Trowel	LIQUINOX	X .
ODOR	CLAY	DREDGE	OTHER	
COLOR	TALCOSE	OTHER		
A 000000000 10000000000000	OTHER			
Associated field Dup  ANALYTICAL PARAMETERS	Equip BLK		MS/MSD: Yes	
WATER	METHOD NUMBER FILTERED		VOLUME EQUIRED Notes:	EPA 300.0
U voc	8260	pH<2 HCL 4* c	3 X 40 mL	
SVOC	8270		2 X 1L AG	SM 18
NDMA TAL METALS	EPA 1625 6000/7000		2 X 1L AG 1 500 mL poly	SW 846, 6010B
Hex-Chromium	3060A/7196A		1 500 mL poly no Headspace	
opex-kempore	mod 8000		3X 40 mL vial	
<del>                                   </del>			CONTRACTOR OF THE PROPERTY OF	
ANALYTICAL PARAMETERS SOIL	METHOD	PRESERVATION VO	NAME ALL	
□ voc	NUMBER 8260	METHOD REC	DLUME Notes:	1
svoc	8270		2-low (DI) & 1-high (MEOH) 1 8 oz	
NDMA	mod 8270	1.270	1802	
TAL METALS	6000/7000		1 4 oz	50 de
Hex-Chromium	3060A/7196A	4° c	1 4 oz	
	***********			
NOTES				
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MACTEC ENGINEERING AND CONSULTING	PAGE OF
FIELD DATA RECORD - SURFACE WATER/ SEDIN	MENT SAMPLING
PROJECT Ofin Chemical Superfund Site JO	DATE (1/12/07)
FIELD SAMPLE NUMBER ISW-1 ACTIVITY TIME	72.4
Picto ornic de Homela	Start 1994 END 1913
OC SAMPLES COLLECTED	
SURFACE WATER DATA	EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH 2' SPEC. COND .547 ms	☐ 3EAKER/Bottle STREAM RIVER DECON FLUIDS USED:
	PACS BOMB LAKE/ POND DI WATER
FROM SURFACE 0.1 FT D.O. 3.54 PPM	PERISTALTIC PUNP SEEP POTABLE WATER
TEMPERATURE SALINITY SALINITY	FILTER/NUMBER MARSH Delicated
S.49 DEG C PPM	OTHER OTHER TUSINA
TURBIDITY NTUS ORP GO mV	
PH / 42	
S. 93 UNITS Associated field Dup	Equip BLX MS/MSD: Yes
SEDIMENT DATA	
DEPTH OF SEDIMENT TYPE OF SEDIMENT:	EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE DISCRETE ORGANIC	HAND CORER DI WATER
COMPOSITE	S.S. SPOON POTABLE WATER
SAMPLE OBSERVATIONS GRAVEL	Shovel-Trowns LYOUNOX
ODORCLAY	OREDGE OTHER
COLORTALCOSE	OTHER
OTHER	
Associated field Dup Equip BEK	MS/ASD: Yes
ANALYTICAL PARAMETERS WATER METHOD METHOD	PRESERVATION VOLUME
NUMBER FILTERE  S260  NUMBER  S260	pH<2 HCL 4'c 3 X 40 mL FP/1 300,0
SVOC 6270	4 G 2X 1LAG
NDMA EPA 1625 TAL METALS 6000/7000	nHe2 HNO3 4° c 1 500 ml note
Hex-Chromium 3060A/7196A	4°C no Heidspess 1 500 mL poly no Headspace COIUB
opex-kempore mod 8000	4° a 3X 40 mL vial
ANALYTICAL PARAMETERS SOIL METHOD	PRESERVATION VOLUME Notes:
Voc 3260	METHOD REQUIRED DI and MEOH 2-fow (DI) & 1-high (MEOH)
SVOC 8270	4°c 18 oz
NDMA   mod 8270   TAL METALS   6000/7000	4°C 18 0Z
Hex-Chromium 3060A/7196A	4°C 14 0Z
NOTES	
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MACTEC ENGINEERING AND CONSULTING	PAGE OF
FIELD DATA RECORD - SURFACE WATER/ SEDIME	NT SAMPLING
PROJECT Olin Chemical Superfund Site JOB N	UMBER DATE 11 12 07
FIELD SAMPLE NUMBER  14 RCW  ACTIVITY TIME	START 1270 END 1230 Sample Time 1230
OC SAMPLES COLLECTED	
SURFACE WATER DATA	EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH AT LOCATION 4.9 FT SPEC. COND 1.62 ms/ch	
DEPTH OF SAMPLE O.I FT D.O. 5.35 PPM	PACS BOMB LAKE/ POND DI WATER  PERISTALTIC PUMP SEEP POTABLE WATER
TEMPERATURE 4.65 DEG C SALINITY PPM	FILTER NUMBER MARSH Weducasd
TURBIDITY ORP	OTHER OTHER TILLING
PH C.04 UNITS Associated field Dup	Equip BLK MS/MSD: Yes
SEDIMENT DATA	
SEDIMENT DATA	
DEPTH OF SEDIMENT:	EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE DISCRETE ORGANIC	HAND CORERDI WATER
COMPOSITE	S.S. SPOON POTABLE WATER
SAMPLE OBSERVATIONS GRAVEL	Shovel-Trowel LIQUINOX
ODORCLAY	OREDGEOTHER
COLORTALCOSE	OTHER
OTHER	
Associated field Dup Equip BLK	MS/MSD: Yes
ANALYTICAL PARAMETERS WATER METHOD	PRESERVATION VOLUME
NUMBER FILTERED VOC 8260	METHOD REQUIRED Notes: (C.A. ZAA
SVOC 8270	4°C 2Y II AC
NDMA EPA 1625	Na2S2O3 4°c 2 X 1L AG
TAL METALS 6000/7000	pHc2 HNO3 4° c 4 500 ml pch.
Hex-Chromium 3060A/7196A	4° C to Headspace 1 500 mL poly no Headspace 50 846
opex-kempore mod 8000	4° c 3X 40 mL vial
	4010B
ANALYTICAL PARAMETERS SOIL METHOD	PRESERVATION VOLUME Notes:
NUMBER 8260	METHOD REQUIRED
SVOC 8270	DI and MEOH 2-low (DI) & 1-high (MEOH) 4' C 1 8 oz
NDMA mod 8270	4°C 18 oz
TAL METALS 6000/7000	4°C 14 0Z
Hex-Chromium 3060A/7196A	4°C 14 0Z
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MACTEC ENGINEERING AND CONSULTING	PAGE OF /
FIELD DATA RECORD - SURFACE WATER/ SEDIM	MENT SAMPLING
PROJECT Olin Chemical Superfund Site JC	B NUMBER DATE N 1207
FIELD SAMPLE NUMBER P2 17 RR ACTIVITY TIM	E START 1700 END 1715 Sample Time 1715
QC SAMPLES COLLECTED 471	•
SURFACE WATER DATA	EQUIPMENT USED TYPE OF SURFACE WATER
WATER DEPTH AT LOCATION 0.5 FT SPEC. COND 1.72 m	SICM BEAKER/Bottle STREAM/ RIVER DECON FLUIDS USED:
DEPTH OF SAMPLE J. 1 FT D.O. 4.13ppm	☐ PACS BOMB ☐ LAKE/ POND ☐ DI WATER  PERISTALTIC PUMP ☐ SEEP ☐ POTABI F WATER
TEMPERATURE CONTRACTOR	☐ PERISTALTIC PUMP ☐ SEEP ☐ POTABLE WATER ☐ FILTER/ NUMBER ☐ MARSH ☐ Del. (Kt.)
7.11 DEG C SALINITY - PPM	OTHER OTHER Tring
TURBIDITY - NTUS ORP 155 mV	
PH S.45 UNITS Associated field Dup DUP	Equip BLK MS/MSD: Yes
SEDIMENT DATA	
DEPTH OF SEDIMENT:	EQUIPMENT FOR COLLECTION DECON FLUIDS USED
TYPE OF SAMPLE DISCRETE ORGANIC	HAND CORER DI WATER
COMPOSITE	S.S. SPOON POTABLE WATER
SAMPLE OBSERVATIONS GRAVEL	Shovel-Trowel LIQUINOX .
ODORCLAY	DREDGEOTHER
COLOR TALCOSE	OTHER
JOTHER	Total Control
Associated field Dup Equip BLK ANALYTICAL PARAMETERS	MS/MSD: Yes
WATER METHOD NUMBER FILTERI	PRESERVATION VOLUME REQUIRED Notes: E/A 300.0  pH<2 HCL 4' c 3 X 40 mL  4' c 2 X 1L AG  Na2S203 4' c 2 X 1L AG  pH<2 HN03 4' c 1 500 mL poly  4' C no Headspace 1 500 mL poly no Headspace  4' C 3 X 40 mL vial  FRESERVATION VOLUME REQUIRED Notes: E/A 300.0  Sm - 18  SW 846  4' C no Headspace 3 X 40 mL vial  GU W 8
VOC 8260	pH<2 HCL 4'c 3 X 40 mL
SVOC 8270 NDMA EPA 1625	4° c 2 X 1L AG
TAL METALS 6000/7000	NazS2O3 4° c 2 X 1L AG pH<2 HNO3 4° c 1 500 mL poly SIN 846
Hex-Chromium 3060A/7196A	4° C no Headspace 1 500 mL poly no Headspace
opex-kempore mod 8000	4° c 3X 40 mL vial 60 60 8
	-
ANALYTICAL PARAMETERS	
SOIL METHOD	PRESERVATION VOLUME Notes:
VOC 8260	METHOD REQUIRED DI and MEOH 2-low (DI) & 1-high (MEOH)
SVOC 8270	4°C 180Z
NDMA mod 8270	4°C 18 0Z
TAL METALS 6000/7000	4 C 14 0Z
Hex-Chromium 3060A/7196A	4'C 14 0z
NOTES	
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MACTEC ENGINEERING AND CONSUL	TING	1917/00/0	-57769CADMIES	PAGE   OF
FIELD DATA RECORD - SUR	FACE WATER/ SEDIMEN	IT SAMPLING	10	
PROJECT Olin Chemical Superfund Site	JOB NU	MBER	]	DATE [[]] 07
FIELD SAMPLE NUMBER PZ-18 R	ACTIVITY TIME	START 1400 END	1415	Sample Time 1415
QC SAMPLES COLLECTED YES				
SURFACE WATER DATA		EQUIPMENT USED	TYPE OF SURFACE W	ATER
	SPEC. COND . 4.30 ms/CM	BEAKER/Bottle	STREAM RIVE	R DECON FLUIDS USED:
DEPTH OF SAMPLE		PACS BOMB	LAKE/ POND	DI WATER
THOM SUM ACC	V.03 PPM	PERISTALTIC PUMP	SEEP	POTABLE WATER
TEMPERATURE 5.81 DEG C	SALINITY	FILTER/ NUMBER	MARSH OTHER	Dedicated Tubing
TURBIDITY NTUS.	- q mV			
PH 6.22 UNITS Associated field I	- Oup	Equip BLK	MS/MS	Yes
SEDIMENT DATA				
DEPTH OF SEDIMENT	TYPE OF SEDIMENT:			
TYPE OF SAMPLE DISCRETE	ORGANIC	EQUIPMENT FOR COLLECTION DE	DI WATER	
COMPOSITE	SAND	s.s. spoon	POTABLE WATER	
SAMPLE OBSERVATIONS	GRAVEL	Shovel-Trowel	LIQUINOX	9
ODOR	CLAY	DREDGE	OTHER	
COLOR	TALCOSE	OTHER		
	OTHER			
Associated field Dup	Equip BLK	MS/MS	SD: Yes	- Processor - Company of Company
ANALYTICAL PARAMETERS WATER	METHOD NUMBER FILTERED	PRESERVATION VOLUM METHOD REQUIR		
□ voc	8260	pH<2 HCL 4°C 3 X 40		EPL 300.0
svoc	8270	4°c 2 X 1 L	2012	Sm 18
NDMA TAL METALS	EPA 1625 6000/7000	Na2S2O3 4° c 2 X 1L pH<2 HNO3 4° c 1 500 r		
Hex-Chromium	3060A/7196A	New years and anythering	mL poly mL poly no Headspace	6010 B
opex-kempore	mod 8000		mL vial	
ANALYTICAL PARAMETERS SOIL	METHOD	PRESERVATION VOLUME	NATION AND ADDRESS OF THE PARTY	- 1160-
□ voc	NUMBER 8260	METHOD REQUIRED	2	, e
Svoc	8270	4'c 18 oz	DI) & 1-high (MEOH)	
NDMA	mod 8270	4°C 18 0Z		
TAL METALS	6000/7000	4°C 14 0Z		7 - 1 - 1 - 1
Hex-Chromium	3060A/7196A	4°C 14 oz		
	·	-		
NOTES				
NOTES				
		Name of the Control o	1.	1
		SIGNATURE:	Al He	
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MACTEC ENGINEERING AND CONSULTIN	NG		***************************************	PAGE ( OF /
FIELD DATA RECORD - SURFA	CE WATER/ SEDIME	NT SAMPLING		
PROJECT Ofin Chemical Superfund Site	JOB N	UMBER [		DATE 11 12 07
FIELD SAMPLE NUMBER 50-17	ACTIVITY TIME	START 1505	END 1515	Sample Time 1515
QC SAMPLES COLLECTED -				
SURFACE WATER DATA		EQUIPMENT USED	TYPE OF SURFACE	WATER
WATER DEPTH CO. 3 SPE	EC. COND 1.43 mS/CM	BEAKER/Bottle	STREAM RI	VER DECON FLUIDS USED:
DESTRUCTION OF THE PROPERTY OF	State and the state of the stat	PACS BOMB	LAKE/ PONG	DIWATER
FROM SURFACE 0. FT	7.61 PPM	PERISTALTIC PU	JMP SEEP	POTABLE WATER
TEMPERATURE 7.42 DEG C SAL	INITY	FILTER/ NUMBER	R MARSH	
TURBIOITY ORF		OTHER-	OTHER	****
PH TOTAL	180 mV	1		
5.56 UNITS Associated field Dup		Equip BLK	MSJ	MSD: Yes
SEDIMENT DATA			-111	
DEPTH OF SEDIMENT TYPE	E OF SEDIMENT:	EQUIPMENT FOR COLLECTION	N DECON FLUIDS USED	
TYPE OF SAMPLE DISCRETE	DRGANIC	HAND CORER	DIWATER	
COMPOSITE	SAND	5.S. SPOON	POTABLE WATER	
SAMPLE OBSERVATIONS	GRAVEL	Shovel-Trowel	LIQUINOX	
ODOR	CLAY	DREDGE	OTHER	
COLOR	TALCOSE	OTHER		
	OTHER			
Associated field Dup  ANALYTICAL PARAMETERS	Equip BLK		MS/MSD: Yes	
WATER VOC	NETHOD NUMBER FILTERED		VOLUME REQUIRED Notes:	- 5PA POU, U
svoc	8260 8270	pH<2 HCL 4" c. 4" c		- In 1818
NDMA	EPA 1625	Na2S2O3 4° c	2 X 1L AG	
TAL METALS	5000/7000	pH<2 HNO3 4° c	1 500 mL poly	- SW 846 .
Hex-Chromium opex-kempore	3060A/7196A mod 8000	4° C no Headspaza	1 500 mL poly no Headspace	
U dpex-kempore	mod 6000	4°C	3X 40 mt. vial	GUIOB
ANALYTICAL PARAMETERS				
SOIL	METHOD NUMBER		VOLUME Notes:	
□ voc	3260	DI and MEOH	EQUIRED 2-low (DI) & 1-high (MEOH)	
SVOC	8270	4°C	1 8 oz	
NDMA	mod 8270	4. c	1 8 oz	true
TAL METALS	6000/7000	4* G	1 4 oz	
Hex-Chranium	3060A/7196A	4°C	1 4 02	
		-		
NAMES	4			
NOTES				
		SIGNAT	URE:	
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FIELD DATA RECORD - LO	W FLOW GROUNDWA	ATER SAM	PLING					
PROJECT Olin Smi Annual	'07 SAMPLE I.D	. NUMBER	6w 20.	20		ROUN	D NO.	
EXPLORATION ID: 202 D		SITE TYPE	PE EPA Superfunt			DATE 11 13 07		
TIME START 0955 END	1130	JOB NUMBER	630006	ادان		FILE TYPE		
NATER LEVEL / PUMP SETTINGS	MEASUREMENT POINT TOP OF WELL RISER TOP OF PROTECTIVE OTHER	CASING CASI	TECTIVE NG STICKUP M GROUND)		CASIN	ECTIVE IG / WELL RENCE	FT	
TOWATER 5.94 F	WELL DEPTH (TOR)		ENTAIR		PPM DIAME	ETER L	IN	
DRAWDOWN 0.18 GA			SSURE			CASING V	NO N/A	
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch TOTAL VOL. PURGED (purge rate (milliliters per minute) x time du	. D3	REFI	LL C	/	PSI DISCH			
PURGE DATA  DEPTH TO PURGE TIME WATER (ft) RATE (ml/m)	SPECIFIC TEMP. CONDUCTANCE (deg. c) (ms/cm)	pH DISS	g/L) (n	tu) (	PUMP EDOX INTAKE mv) DEPTH (fi	) COMMENT	rs	
1015	13.52 3.86 13.49 3.78		5 20	/ S	19			
	13.55 3:71	5.83 .1	- 7	14				
1026	13.69 8.68	5.83 .1	3 15	15	1			
Control of the contro	13,65 3.66	5.82 .0 5.82 .0	1 il 5 il	15	3	3432/		
	13.72 3.62 E GW 202	5.82 0 0 - 00P	_	M50	3			
SAMA	.L 9W 802	B - 407	1/13 7	1.13.2				
QED BLADDER	TYPE OF TUBING  TEFLON OR TEFLON LINED  HIGH DENSITY POLYETHYLEN  OTHER	POL	PUMP MATERIA YVINYL CHLORII INLESS STEEL ER	ONE CONTRACTOR	TYPE OF I		-	
ANALYTICAL PARAMETERS o Be Collected Check if requested for collection	METHOD NUMBER	MET	RVATION HOD ify QAPP	VOLUME REQUIRED Specify QAPP	SAMPLE COLLECTE			
SVOC SVOC VINORGANICS Other Other Other	8260B 8270 6010 	HCL / 4 DE	G. C G. C	3 X 40 mL 2 X 1 L AG インシャ ション・フェッ		/OC ORGANICS her		
Other Other Other Other Other		=				her her her her		
	NUMBER OF GALLONS GENERATED	LOC	ATION SKETC	1			(	
NOTES								
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FIELD	DATA RE	CORD - L	OW FLOW	GROUNDW	VATER S	SAMPLIN	IG			
PROJECT	Gl,n	builmin.	570,	SAMPLE	.D. NUMBER	Gu	325			ROUND NO.
EXPLORAT		GW355			SITE TY	PE SU	pertund			DATE 11 1407
TIME	START /4	30 EN	D 1530		JOB NUME		2000 (00	10		FILE TYPE
	EVEL / PUMP			REMENT POINT				7		, rec in c
			TOF	OF WELL RISER		PROTECTIVE CASING ST	CKUP		PROTECT CASING	
INITIAL DE		าป	100 EA	IER	100000000000000000000000000000000000000	(FROM GRO	OUND)	FT	DIFFERE	NCEFT
TO WAT		77	FT WELL D	EPTH	FT	AMBIENT A	R J.U	PPM	WELL DIAMETE	R 2 IN
FINAL DEF		5	FT SCREEN	SA S		PID WELL	0.0		WELL	YES NO N/A
DRAWDO' VOLU				OF DRAWDOWN		PRESSURE		PPM	INTEGRI	TY: CAP
TOTAL	(0)		1016	OTAL VOLUME PL	JRGED	TO PUMP		PSI	DISCHAF	
PURC	SED 4	, 2.4 r minute) x time	GAL duration (minutes)	x 0.00026 gal/mill	iliter)	TIMER SETTING			TIMER SETTING	
PURGE D.	DEPTH TO	PURGE	TEMP.	SPECIFIC CONDUCTANCE	pH	DISS. 02	TURBIDITY	REDOX	PUMP INTAKE	
2435	7.45	RATE (ml/m)	(deg. c)	(ms/cm) /, 0 /	(units)	(mg/L) 2.26	(ntu) 8.74	(mv)	DEPTH (ft)	COMMENTS
1440	1.73	500	17.26	,999	7.19	1,94	5.69	-146		
1445		1	17.25	,940	7.13	1.82	4.18	-202		
1515		1	17,10	.866	7.04	1.68	1.12	-237		
1520			16.99	.864	7.04	1.71	1.12	-238		
1525		Y	16.69	.863	7.04	1.74	0.29	-237		
1530		5	mple							
		000	057							
EQUIPMENT DOCUMENTATION  TYPE OF PUMP  QED BLADDER  SIMCO BLADDER  HIGH DENSITY POLYETHYLENE  GEOPUMP  ANALYTICAL PARAMETERS TO Be Collected  Check if requested for collection  VOC  SYOC  SYOC  SYOC  VINORGANICS  Other  Other  Other  Other  Other  Other  Other				ENE _	PE OF PUMP POLYVINYI STAINLESS OTHER PRESERVATION METHOD Specify CAF HCL / 4 DEG. C 4 DEG. C	ON VOLUM REQUIF P Specify Q G. C 3 X 40 mL 2 X 1 L AC	APP	TEFLON  OTHER  SAMPLE COLLECTED	ck if collected  GANICS	
Ott							_ = =		Other Other	
PURGE WA		is NO	NUMBER OF GA	LLONS		LOCATION	SKETCH			
NOTES	Rotten	Eng o	7		_					MACTEC
SIGNATUR	E 7/1	MC								MACIEC

FIELD DATA	RECORD - LO	OW FLOW G	ROUNDW	ATER SA	AMPLI	NG			
PROJECT Oliv	- Wilming	TOIT	SAMPLE I.I	D. NUMBER	Pi	218 R			ROUND NO.
EXPLORATION ID:	218 R			SITE TYPE	E FP	X Superfu	nd		DATE (1 1407
TIME START	liis en	0/200	]	JOB NUMBE	R 63	00060010			FILE TYPE
INITIAL DEPTH TO WATER  FINAL DEPTH TO WATER  DRAWDOWN VOLUME	1.9 3.28 ,22 (6(2-inch) or x 0.65 (4-inch)	FT WELL DEF (TOR)  FT SCREEN LENGTH  GAL RATIO OF TO TOT		FT FT NOOLUME FREED T	PROTECTII CASING ST (FROM GRI PID AMBIENT A MOUTH PRESSURE TO PUMP REFILL TIMER	VE TICKUP OUND)	PPM PPM PPM	WELL DIAMETE WELL INTEGRIT	TY: CAP V CASING V COCKED COLLAR
	iters per minute) x time		0.00026 gal/millil		SETTING			SETTING	
PURGE DATA DEPTH WATER (135 3.25 )140  145  150  155  158  130	R (ft) RATE (ml/m)	(deg.c) 9.02 9.07 9.13 9.20 9.27	SPECIFIC CONDUCTANCE (ms/cm) .634 .583 .566 .562 .561 .563	(units) 7.17 7.19 7.22 7.17 7.19	DISS. 02 (mg/L) 0.84 0.45 .23 0.06 0.06	TURBIDITY (ntu) 25.3 7.99 3.39 3.17 2.63	REDOX (mv) -98 -98 -96 -93 -93 -95	PUMP INTAKE DEPTH (ft)	COMMENTS
VOC SVOC INORGANIC Other Other Other Other Other Other Other	DER DDER RAMETERS  uested for collection	HIGH DENSITION OTHER CANAL METHOD NAME TO NAME	TEFLON LINED TY POLYETHYLE THOO BER	PRI	and the same	ON VOLUM REQUIR PP Specify QA	ED PP	SAMPLE COLLECTED Chec SVOC SVOC SVOC Other Other Other	ck if collected
Other								Other Other	
PURGE OBSERVA PURGE WATER CONTAINERIZED NOTES	YES NO	NUMBER OF GAL GENERATED	LONS	-	LOCATIO	N SKETCH			y
SIGNAZI S	I we								MACTEC

FIELD DATA R	E-Manager 124	ASSESSMENT TO PROCEED BY	GROUNDW □	ATER S	AMPLI	NG			
PROJECT Olin		ngra	SAMPLE I.I	D. NUMBER				]	ROUND NO.
EXPLORATION ID:	[A-1		_	SITE TYP			EPA		DATE 11 11 07
TIME START 13	30 EN	ND (413		JOB NUMB	SER 63	000 600	16		FILE TYPE
FINAL DEPTH TO WATER  DRAWDOWN VOLUME (initial - final x 0.16 {2}  TOTAL VOL. PURGED (purge rate (milliliters)  PURGE DATA  TIME WATER (ft. 1355 7.19  JUOD	7. 19  7. 19  2-inch) or x 0.65 (4-1)  7. 5 4 s per minute) x time	FT WELL DE (TOR)  FT SCREEN LENGTH  GAL RATIO O TO	DF DRAWDOWN V. DTAL VOLUME PUI  X 0.00026 gal/millil  SPECIFIC CONDUCTANCE (ms/cm)  8 9 8  4 0 0	FT  FT  /OLUME IRGED  pH (units)  6.86	PROTECTIF CASING ST (FROM GRI FID WELL MOUTH PRESSURE TO PUMP REFILL TIMER SETTING  DISS. O2 (mg/L) 7.71	TURBIDITY (ntu)  2.83  1.46	PPM PPM PSI REDOX (mv) ///5	WELL DIAMETE WELL INTEGRI	TYES NO N/A  TY: CAP CASING LOCKED COLLAR  TGE
1405	-	14.29	899	6.80	.44	1.02	117	-	
1410	Shu	14.33	847	6.40	.45	0.87	117	-	
EQUIPMENT DOCUM  TYPE OF PUMP  QED BLADDER  SIMCO BLADDE  GEOPUMP  ANALYTICAL PARAM To Be Collected  Check if request  VOC SVOC  INORGANICS  Other	MENTATION R ER METERS ated for collection	TYPE OF TUBING TEFLONOR HIGH DENSI OTHER 82601 8270 6010	R TEFLON LINED  ITY POLYETHYLE  ITHOD  MBER	ENE	POLYVINY STAINLES OTHER  RESERVATI METHOD Specify QAI HCL/4 DEG. C 4 DEG. C	ION VOLUM REQUIF PP Specify Q	RED  DAPP  L  G	SAMPLE COLLECTED Chec	ck if collected C RGANICS
PURGE WATER CONTAINERIZED Y  NOTES	YES (NO)	NUMBER OF GAI GENERATED	LONS	-					MACTEC

FIELD	DATA RE	CORD - L	OW FLOW	GROUNDW	ATER S	SAMPLIN	G		****	200000
PROJECT	olin.	w.1*	מימפתית	SAMPLE I.	D. NUMBER	G	w. 201	5		ROUND NO.
EXPLORAT	ION ID:	٠ س٥	2015		SITE TY	PE SU	perfur	~~		DATE 11114 107
TIME	START ) ;	IC EN	D 11:4	>	JOB NUMB	ER 63	0006 00	10		FILE TYPE
INITIAL DEF TO WAT FINAL DEF TO WAT DRAWDOI VOLUI	PTH 5	.69 .C1	FT WELL (TOR)  FT SCREE LENGT  GAL RATIO	N /	99 FT	PROTECTIVE CASING STIC (FROM GROU PID AMBIENT AIR PID WELL MOUTH PRESSURE TO PUMP	KUP IND)	PPM PSI	WELL DIAMETE	NCE FT
TOTAL V PURG (purge r	ED Z		GAL duration (minutes	0 · • 2	liter)	REFILL TIMER SETTING	/		DISCHAR TIMER SETTING	
TIME 11:15 11:18 11:21 11:24 11:23 11:36	DEPTH TO WATER (N)  5 . 01  5 . 01  5 . 01  5 . 01	PURGE RATE (ml/m) 350 350 350 350 350 350	TEMP. (deg.c) 12.72 12.72 12.73 12.74 12.74	3.93 3.93 3.95	pH (units) 6.53 6.60 6.64 6.64	DISS. 02 (mg/L) 1 · Z8 20 1 40 1 60 1	TURBIDITY (ntu) 62.9 16.9 25.2 24.9 22.6 20.1	REDOX (mw) 29 30 34 36 36	PUMP INTAKE DEPTH (ft)	COMMENTS
		P.C								
TYPE O	NT DOCUMEN IF PUMP D BLADDER ICO BLADDER OPUMP	ITATION	HIGH DEN	NG R TEFLON LINED SITY POLYETHYLE DYB		PE OF PUMP N POLYVINYL ( ) STAINLESS S OTHER	CHLORIDE		TYPE OF BLA	ODDER MATERIAL
To Be Collected Chi VOC SVC	eck if requested	for collection	826 827 601	0		RESERVATION METHOD Specify QAPP HCL / 4 DEG. C 4 DEG. C	REQUIRE Specify QA C 3 X 40 mL 2 X 1 L AG	ED (	voc	GANICS
PURGE OF PURGE WA CONTAINER			NUMBER OF G GENERATED	ALLONS		LOCATIONS	БКЕТСН			
NOTES		×			-					MACTEC

FIELD DATA RECORD - LOW F	FLOW GROUNDW	VATER SAM	MPLING					
PROJECT Olin, Wilmi	ng ton SAMPLE	I.D. NUMBER	PZ -1	LER			ROUND	ю.
EXPLORATION ID: PZ-16 FR		SITE TYPE	Supe	efun	9		DATE 11	11410-
TIME START 8:50 END 4	(; 20	JOB NUMBER	6300			FI	LE TYPE	
INITIAL DEPTH TO WATER TO WATE	MEASUREMENT POINT TOP OF WELL RISER TOP OF PROTECTIVE OTHER  WELL DEPTH (TOR)  SCREEN LENGTH  RATIO OF DRAWDOWN V	E CASING CAS (FRC	DIECTIVE SING STICKUP OM GROUND) BIENT AIR WELL UTH ESSURE	40.1	PPM		YES CAP	FT IN NO N/A
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch))  TOTAL VOL.  PURGED  GAL	TO TOTAL VOLUME PU		PUMP	_	PSI		OCKED OLLAR 👱	==
(purge rate (milliliters per minute) x time duration	n (minutes) x 0.00026 gal/milli		TING			SETTING		
TIME WATER (ft) RATE (ml/m) (de 9:00 3.56 70 8 9:06 3.56 70 8 9:06 3.56 70 8	SPECIFIC CONDUCTANCE (ms/cm) - 38	(units) (n 7.22 8 7.30 9 7.35 1	1.21 9.	RBIDITY (ntu) 86 27 . Z8	REDOX (mv) -167 -170	PUMP INTAKE DEPTH (ft)	COMMENTS	
	·61 2·30			. 40	-172			
9:15 Sample								
QED BLADDER	E OF TUBING TEFLON OR TEFLON LINED HIGH DENSITY POLYETHYLE DTHER L P PE	POI	F PUMP MATER LYVINYL CHLOR AINLESS STEEL HER		[	TYPE OF BLADE TEFLON OTHER	IER MATERIAL	-01
ANALYTICAL PARAMETERS To Be Collected  Check if requested for collection  VOC SVOC INORGANICS Other	8260B 8270 8010 355 · 1 300 · 0/ 28 b/	ME Spec HCL 4 DE 4 DE 14 25108 14		VOLUM REQUIRE Specify QA 3 X 40 mL 2 X 1 L AG	ED (	SAMPLE OLLECTED Check if VOC SVOC INORGA Other Other Other Other Other Other Other Other		
	BER OF GALLONS ERATED	Loc	CATION SKET	CH				
NOTES							<b>∌</b> MA	CTEC

FIELD [	DATA REG	CORD - LO	W FLOW	GROUNDW	ATER S	AMPLIN	G			
PROJECT [	011	m, wil	mingr	SAMPLE I.	D. NUMBER	PZ	-17 FR			ROUND NO.
EXPLORATI	ION ID: P	Z -17 R	R		SITE TY	PE SU	perfun	ಎ		DATE 11/14/07
TIME [	START 9	. 50 END	10:4	2	JOB NUMB		000 LCC 1			FILE TYPE
WATER LE			TOP	REMENT POINT P OF WELL RISER OF PROTECTIVE HER	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT	PROTEC CASING DIFFERE	/WELL
FINAL DEP	тн 2	.01	(TOR)	6.0	FT	AMBIENT AIR		РРМ	DIAMETE	YES NO N/A
DRAWDOV VOLUM (initial - 1 TOTAL V PURG	final x 0.16 (2-in	ch) or x 0.65 (4-in	ch)) TO TO	DF DRAWDOWN VOTAL VOLUME PUI		MOUTH PRESSURE TO PUMP REFILL	/ / /	PPM PSI	DISCHAF	TY: CAP CASING COCKED COLLAR COLLAR
				x 0.00026 gal/millili	iter)	TIMER SETTING			TIMER SETTING	,
TIME 10:10	DEPTH TO WATER (ft)  2.86	PURGE RATE (ml/m)	TEMP. (deg. c) 10 · 9.2	SPECIFIC CONDUCTANCE (ms/cm)  1 · 22	pH (units) 7.34	DISS. 02 (mg/L) 2.87	TURBIDITY (ntu) 59.3	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
10:16	2.86	75	11.35	1.34	7.46	770277	23.4	-130		
10:19	2.86	75	11.56	1.35		8.47	15.2	-126		
10:22	2.86	75	11.69	1 - 35		9.07	13.7	-125	$\perp$	
10:35	A CONTRACTOR OF THE PARTY OF TH	75	11.76	1.35	7.49	9.86	12.6	-119	1	
	200	P.C								
TYPE C  OE  SIM  GE  ANALYTIC To Be Collecte  Ch  SVC  NOC  NOC  Oth	eck if requested C OC ORGANICS er Per Per Per Per Per Per Per Per Per	TERS for collection	HIGH DENS  ** OTHER  ME NU  826 827 601	R TEFLON LINED SITY POLYETHYLE LDPE  THOD MBER  DB	NE	PE OF PUMP POLYVINYL STAINLESS OTHER RESERVATION METHOD Specify QAPP HCL / 4 DEG. C 4 DEG. C	VOLUM REQUIR Specify QA C 3 X 40 mL 2 X 1 L AG	ED (	SAMPLE COLLECTED Chec	ck if collected  C GANICS
PURGE O	BSERVATION	IS			-2011	LOCATION	SKETCH			
PURGE WA CONTAINE NOTES	RIZED YES		NUMBER OF G. GENERATED							
	PET	b)eum	n 000	•						(48)
SIGNATUR	e 00	and for	m							MACTEC

FIELD DA	ATA RE	CORD - L	OW FLOW	GROUNDW	ATER S	SAMPLIN	G		Carried States	
PROJECT	os in	wis	mingre	SAMPLE I.	D. NUMBER	GV	~- 795			ROUND NO.
EXPLORATION	N ID: G	· ~ *	15		SITE TY	PE 50	perfun	J		DATE 11114/2
TIME ST	TART 12:	30 EI	ND 13:2	•	JOB NUMB		CCC666 1			FILE TYPE
WATER LEVI	EL / PUMP	SETTINGS	TO TO	PREMENT POINT OF OF WELL RISER OP OF PROTECTIVE		PROTECTIVE CASING STIC (FROM GROU	EKUP /	FT		CTIVE S/WELL
INITIAL DEPTH TO WATER	H 3.	46		DEPTH 11.4	5 FT	PID AMBIENT AIR		PPM	WELL	
FINAL DEPTH TO WATER		50	FT SCREE		FT	PID WELL	40.1	PPM	WELL	YES NO N/A
DRAWDOWN VOLUME (initial - fina TOTAL VOL	al x 0.16 (2-in	. ~ 6, 5 ch) or x 0.65 (4	GAL KATIO	OF DRAWDOWN V	OLUME	PRESSURE TO PUMP	/	PSI	DISCHA	CASING LOCKED COLLAR
PURGED (purge rate		r minute) x time	GAL duration (minutes	s) x 0.00026 gal/millil	liler)	TIMER SETTING			TIMER SETTING	
	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
12:42	3.5c	400	12-12	2.16	6.21	401	126	3	DEF TIT(II)	COMMENTS
	3.50	400	12.06	2.13	6.19	40-1	92.6	28		
	3.50	400	12.22	2.14	6.19	101	61.3	14		
	3.50	400	12.31	2.16	6.19	40.1	49.2	10		
	3.50	Hee	12.39	2.19	6.20	40.1	33.7	-4		
- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	3.50	400	12.39	2.20	6.21	20.1	28.6	-1Z		
	3.50	400	12.36	2.20	6.21	1.04	21.33	- 26		
	3.50	400	12.36	2.21	6. ZI	40.1	14.0	-41		
13:10		400	12.39	2.21	6.21	LO.\	13.2	-50		
SIMCO SIMCO SEOP ANALYTICAL To Be Collected	PUMP BLADDER O BLADDER PUMP	TERS	HIGH DEN	R TEFLON LINED	NE _	PE OF PUMP I POLYVINYL STAINLESS: OTHER RESERVATION METHOD Specify QAPP	CHLORIDE STEEL VOLUM REQUIRE	ED 9	TEFLON OTHER SAMPLE	
Other \	SANICS A harmonic G 199	hich mesa) s	827 601		se <b>s</b>	HCL/4 DEG. C 4 DEG. C 4 DEG. C	C 3 X 40 mL 2 X 1 L AG	<b>5</b> 0	voc	C RGANICS
PURGE OBS		s	WILLIAM OF O			LOCATION	SKETCH			
NOTES  SIGNATURE:	Pur		NUMBER OF G GENERATED	as stn	c Ng					MACTEC

	ION ID: GU	w - 78	35		SITE TY	PE 50	perfun	رما		DATE 111
TIME	START 111	OF EN	10 14:3	5	JOB NUMB	1 32 300	00600 \		]	FILE TYPE
WATER LE	EVEL / PUMP S	SETTINGS	MEASU	REMENT POINT P OF WELL RISER P OF PROTECTIVE	CASING	PROTECTIVE CASING STIC		,	PROTEC	Control Control L
INITIAL DEF TO WAT		· 11	FT WELL	DEPTH 10.00		(FROM GROUPID		FI	DIFFER WELL	ENCE
FINAL DEF		. 39	FT SCREE	N -	FT	PID WELL MOUTH		PPM	WELL	YES N
DRAWDOV VOLUM (initial - 1			GAL RATIO	OF DRAWDOWN VO	OLUME	PRESSURE TO PUMP	/	PPM	1	CASING LOCKED COLLAR
TOTAL V	OL.	3	GAL	o.015		REFILL TIMER SETTING	1		DISCHA TIMER SETTIN	IRGE /
PURGE DA		PURGE RATE (ml/m)	TEMP.	SPECIFIC CONDUCTANCE (ms/cm)		DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
14:07	4.39	325	14.55	1.46	5.15	c.69	139	163	DEF TITLES	COMMENTS
Hile	4.39	325	14.31	1.40	The second secon	-	122	166		
14:13	4.39	325	14.06	1 . 38	5.08		85.8	168		
14:16	4.39	325	14.02	1.37	5.13	4 0.1	59.7	159		
14:19	4.39	325	14.00	1.38	5.14	20.1	51.6	159		
14:22	4.39	325	14.00	1.36	5.16	40.1	49.2	153		
14:30	Scon	pre								
om assessed	W. = 1									
	D BLADDER			R TEFLON LINED SITY POLYETHYLEN LDPTE	NE _	POLYVINYL ( STAINLESS S OTHER			TEFLON	
To Be Collected  Che  Void  SVC  INO  Che  Che  Oth  Oth  Oth  Oth  Oth	cal Parameted of the control of the	for collection	826 827 601 3	0		RESERVATION METHOD Specify QAPP HCL / 4 DEG. 0 4 DEG. 0 4 DEG. 0	REQUIR Specify Q/ C 3 X 40 mL 2 X 1 L AG	APP	VOC SVO INOF Othe Othe Othe Othe	ck if collected
ANALYTIC To Be Collected Oth SVC Oth Oth Oth Oth Oth	CAL PARAMET  CC  CC  CC  CRGANICS  er  er  er  er  er  er  er  er  er  e	for collection	826 827 601 3	MBER  08 0 0 0 55.\ 55.0   280(		RESERVATION METHOD Specify QAPP HCL / 4 DEG. C 4 DEG. C	REQUIR Specify Q/ C 3X40 mL 2X1L AG	APP 250	COLLECTED  Che VOC SVO INO INO Othe Othe Othe Othe Othe	ck if collected  CREANICS  COLLEGE  COL
ANALYTIC To Be Collected Che SVC SVC NO Oth Oth Oth Oth Purge of	CAL PARAMET  d  cc if requested if C  CC  CC  CRGANICS  er  er  er  er  er  er  er  er  er  e	for collection	826 827 601 3 3 601	08 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		RESERVATION METHOD Specify QAPP HCL / 4 DEG. 4 DEG. C 4 DEG. C	REQUIR Specify Q/ C 3X40 mL 2X1L AG	APP 250	COLLECTED Che VOC SVO INOs Othe Othe Othe Othe Othe	ck if collected  CREANICS  COLLEGE  COL
ANALYTIC To Be Collected Oth SVC Oth Oth Oth Oth Oth	CAL PARAMET  d  cc if requested if C  CC  CC  CRGANICS  er  er  er  er  er  er  er  er  er  e	for collection	826 827 601 3	08 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		RESERVATION METHOD Specify QAPP HCL / 4 DEG. C 4 DEG. C	REQUIR Specify Q/ C 3X40 mL 2X1L AG	APP 250	COLLECTED Che VOC SVO INOs Othe Othe Othe Othe Othe	ck if collected  CREANICS  COLLEGE  COL

FIELD	DATA RE	CORD - L	OW FLOV	W GROUNDW	ATER S	AMPLIN	G			
PROJECT	0114	· , w ,	, ming	SAMPLE I	D. NUMBER	G	~ . 3451	2	]	ROUND NO.
EXPLORAT	ION ID.	w. 3	458		SITE TY	PE S	uperfu	nd	]	DATE 11/13/07
TIME	START 8:	30 E	4:0	5	JOB NUMB		3000600			FILE TYPE
WATER LI	EVEL / PUMP	SETTINGS	×	SUREMENT POINT TOP OF WELL RISER TOP OF PROTECTIVE OTHER		PROTECTIVE CASING STIE	CKUP	FT	PROTECTI CASING / V DIFFEREN	WELL
TOWAT		18	FT WELL	35.	BIFT	PID AMBIENT AL	40.1	РРМ	WELL DIAMETER	Z 1N
FINAL DEA		. 23	FT SCRI	A (CO)	FI	PID WELL MOUTH	40.1	PPM	WELL	YES NO NA
DRAWDO: VOLU (initiat -	ME final x 0.16 (2-in	00815 ch) or x 0.65 (4	GAL PAT	C OF DRAWDOWN V	OLUME	PRESSURE TO PUMP	_/	PSI	l r	CASING COCKED COLLAR
PURC	ED Z	・ <del>コつ</del> or minute) x time	GAL L duration (minu	es) x 0.00026 gal/milli	Mer)	TIMER SETTING			TIMER SETTING	
PURGE D.	ATA DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP.	SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS, 02 (mg/L)	TURBIDITY (rtu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
8:40	9.23	300	13.27		5.65		2.54	159		
8:46		300	13.19		5.70	2.72	3.36	132		
8:49	9.23	300	13.2		-	4.52	3.32	129		
8:52	9.23	300	13.3	2 0. 180		4.45	2.44	126		
8:55	Sam	ele c	ollec	red						
					-					
			-							
			-							
TYPE (	NT DOCUMENT OF PUMP ED BLADDER MCO BLADDER EOPUMP CAL PARAME	77	HIGH DI	OR TEFLON LINED INSITY POLYETHYLE LOPE WETHOD	ENE C	PE OF PUMP  POLYVINYL  STAINLESS  OTHER  RESERVATIO	CHLORIDE	IE	TYPE OF BLAC TEFLON OTHER SAMPLE	DER MATERIAL
Cr	ceck if requested C C C C C C C C C C C C C C C C C C C	chem Chem		NUMBER  2008 270 DID  355 / Z80 GO VO B		METHOD Specify QAPI HCL / 4 DEG 4 DEG, C 4 DEG, C 1 DEG, C	REQUIR Specily QA .C 3X40 mL 2X11 AG	EQ I	COLLECTED	if collected
PURGE OF		is wo	NUMBER OF GENERATED			LOCATION	SKETCH			
NOTES				Accession of the Control of the Cont						MACTEC
SIGNATUR	it: a	2		2-						

FIELD DATA F	ECORD - LO	OW FLOW	GROUNDW	ATER S	AMPLIN	G			
PROJECT 01	in , wi	J.m Ing	NSAMPLE I.	D. NUMBER	G	w = 20	25	]	ROUND NO.
EXPLORATION ID:	6w. 7	.025		SITE TYP	S 5	uperfu	nel	]	DATE 1113107
TIME START 4	: 23 EN	9:55		JOB NUMBI	ER 6	300060	e 10	]	FILE TYPE
WATER LEVEL / PUI	MP SETTINGS	TOP	REMENT POINT P OF WELL RISER P OF PROTECTIVE HER	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	, FI		/WELL
INITIAL DEPTH TO WATER	6.49	FT WELL D	42		PID AMBIENT AIR	(20)	РРМ	WELL	
FINAL DEPTH TO WATER	6.54	FT SCREEN		C10	PID WELL MOUTH	20.1	PPM	WELL INTEGR	YES NO N/A
DRAWDOWN VOLUME (initial - final x 0.16 (			OF DRAWDOWN VI OTAL VOLUME PUR		PRESSURE TO PUMP	/	PSI	]	CASING X COLLAR COLLAR
TOTAL VOL. PURGED (purge rate (milliliter		GAL	o . o e z 9	•	REFILL TIMER SETTING	/		DISCHA TIMER SETTING	
PURGE DATA DEPTH T TIME WATER (		TEMP. (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
9:28 6.5		13.97	1.75	6.3Z		12-6	106		
9:31 6.5		14.35	1.80		3.63	8.38	68		
9:346.5		14.40	1.60	100 STORY	2.44	4.27	69		
9:40 6.50	250.00	14.44	1.80	6.26	100	2.26	72		
9:43 6.5		14.46	1.80	6.26		2.23	74		
9:46 6 .5		14.49	1.80	6.26	Name of the last o	2.13	74		
	mple	, , , ,							
						***			
						-11)			
EQUIPMENT DOCUM TYPE OF PUMP QED BLADDEI SIMCO BLADE GEOPUMP	3		R TEFLON LINED SITY POLYETHYLE		PE OF PUMP I POLYVINYL STAINLESS OTHER	CHLORIDE		TYPE OF BL TEFLON	
ANALYTICAL PARA To Be Collected  Check if reques			THOD MBER	PF	RESERVATION METHOD Specify QAPF	REQUIRE	ED	SAMPLE COLLECTED Che	ck if collected
Other w	monia.	3.	0		HCL / 4 DEG. 4 DEG. C 4 DEG. C 14 2 Se	2X1LAG	Sc.	SVO INOI Othe Othe	C RGANICS IT
Other Other Other Other Other Other								Othe Othe Othe Othe Othe	st
		7						Othe	
PURGE OBSERVAT PURGE WATER CONTAINERIZED	YES NO	NUMBER OF GA	ALLONS	-	LOCATION	SKETCH			
NOTES									MACTEC

FIELD	DATA RE	CORD - L	OW FLOW	GROUNDW	ATER	SAMPL	ING			
PROJECT	Olin h	Thurs 5TC	137	SAMPLE I.	D. NUMBER	6	W 39		]	ROUND NO.
EXPLORAT	TION ID:	5W 39			SITE TY	PE S	pertint			DATE 11 13 07
TIME	START 1315	) EN	D 1400		JOB NUME	BER 63	ا در کا کاموران	0	Ī	FILE TYPE
WATER L	EVEL / PUMP	THE RESERVE OF THE PARTY OF THE	TC	JREMENT POINT OP OF WELL RISER OP OF PROTECTIVE		PROTECT CASING S	TIVE			CTIVE 6/WELL
INITIAL DE TO WA		71		DEPTH .	FT	PID AMBIENT	(1 :)	FT PPM	WELL	PT PT
FINAL DE TO WA		15 3.14	A CONTRACTOR OF THE PERSON NAMED IN		FT	PID WELL	94015	PPM	WELL	YES NO N/A
DRAWDO VOLU (initial -	JME ,	03 nch) or x 0.65 (4-1	GAL RATIO	OF DRAWDOWN V	OLUME	PRESSUR TO PUMP		PS	]	CASING COLLAR V
TOTAL \ PUR( (purge	GED ~		GAL duration (minute	s) x 0.00026 gal/millil	liter)	REFILL TIMER SETTING			DISCHA TIMER SETTING	
PURGE D	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS, O2 (mg/L)	(ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
/330	3.94	300	11,20	.926	5,416	5.40	8	241		
1335			10 90	949	5.43	4.70	2.89	254		
1340			10.8	.950	5.43	4.42		266		
1345			10,72	946	5.40	4.39	0.12	274		
1755			10.69	.935	5,39	4.93	1.1	283		
1960			10.62	,932	5.39	4.42		288		
				4						
TYPE (	ENT DOCUMENT OF PUMP ED BLADDER MCO BLADDER EOPUMP			OR TEFLON LINED		POLYVIN	IP MATERIAL YL CHLORIDE SS STEEL		TYPE OF BL TEFLON OTHER	
	CAL PARAME	TERS	м	ETHOD UMBER		RESERVAT			SAMPLE	
C c	neck if requested	for collection	<u></u>	OWDER		Specify QA		and the same of th	COLLECTED Che	ck if collected
	OC ORGANICS her		826 827 60			HCL / 4 DE 4 DEG, C 4 DEG, C	EG. C 3 X 40 r 2 X 1 L		VOC SVO INOF	C RGANICS
1000									Othe Othe Othe	·
	her her		= =						Othe	r
1000	her								Othe	
PURGE C	BSERVATION	IS				LOCATIO	N SKETCH			TO DESIRE THE PROPERTY OF THE PARTY OF THE P
PURGE WA		(NO)	NUMBER OF G	ALLONS	_					
NOTES										
SIGNATUR	RE:	Th	20							MACTEC

FIELD DATA REC	ORD - LO	W FLOW	GROUNDY	VATER S	SAMPLIN	G			
PROJECT Olin	Som An	hunt 07	SAMPLE	I.D. NUMBER	61	v 25		]	ROUND NO.
EXPLORATION ID:	GW 25			SITE TY	PE EPA	Sepertund		]	DATE 1( 13 07
TIME START 151	D END	1545		JOB NUMB	GER 67	0006001	J		FILE TYPE
WATER LEVEL / PUMP S	ETTINGS	TO TO	REMENT POINT OF WELL RISER OF PROTECTIV		PROTECTIVE CASING STIC	CKUP			S/WELL NC/
INITIAL DEPTH TO WATER 5.	31	FT WELL D	EPTH	FT	(FROM GRO PID AMBIENT AII		FT PPM	WELL	
TO WATER 5.	67	SCREEN LENGTH	92	FT	PID WELL	0.0	PPM	WELL	YES NO N/A
DRAWDOWN VOLUME (initial - final x 0.16 {2-inc		AL RATIO	OF DRAWDOWN OTAL VOLUME PI	VOLUME	PRESSURE TO PUMP		PSI	]	CASING Z
TOTAL VOL. 3, 7 PURGED (purge rate (milliliters per		IAL uration (minutes)	x 0.00026 gal/mil	liliter)	REFILL TIMER SETTING	_		DISCHA TIMER SETTIN	
PURGE DATA  DEPTH TO  TIME WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	(units)	DISS, O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1515 5.67		12.64	1.57	7.18	0,00	29.9	-104		
1520		12.64	1.57	7.05	0.00	7.55	-93		
1525 1530		12.61	1.57	6.97	0.00	2.1	-90		
1535		12.61	1.57	6.96	0.00		-89		E
1307 (SUS	Sin,	12.63 Le	7.37	(1,9)	0.00		-8-1		Error on VAIT, Trob.d.
EQUIPMENT DOCUMEN  TYPE OF PUMP  QED BLADDER  SIMCO BLADDER  GEOPUMP			IG R TEFLON LINED SITY POLYETHYL		PE OF PUMP POLYVINYL STAINLESS OTHER	CHLORIDE		TYPE OF BI	
ANALYTICAL PARAMET To Be Collected Check if requested to			THOD MBER	P	RESERVATIO METHOD Specify QAP	REQUIRE	ED	SAMPLE COLLECTED	) eck if collected
VOC SVOC INORGANICS Other Accordance Other Other	(r)				HCL / 4 DEG 4 DEG, C 4 DEG, C	.C 3X 40 mL 2X 1L AG (45%) 145%)		Other	DC RGANICS  or  er  er  er
Other Other Other Other								Othe	er er
PURGE OBSERVATION	S		-		LOCATION	SKETCH			
PURGE WATER CONTAINERIZED YES		NUMBER OF GA	ALLONS			प्रतान स्मिन्स्य स्मिन्स्य स्			
NOTES	140								MACTEC

FIELD DATA RECORD - LOW FLOW GI	ROUNDWATER SAMPLIN	IG	
PROJECT Olin Sem. Annual '07	SAMPLE I.D. NUMBER	11 34 S'R	ROUND NO.
EXPLORATION ID: GW 34 5 R D	SITE TYPE EPI	repretend	DATE 11 13 07
TIME START 843 END 125	JOB NUMBER 356	60062016	FILE TYPE
TOP OF	MENT POINT F WELL RISER F PROTECTIVE CASING CASING STI (FROM GRC	CKUP >	PROTECTIVE CASING / WELL DIFFERENCE FT
INITIAL DEPTH TO WATER  ST 7, 99 FT  WELL DEPT (TOR)	TH PID FT AMBIENT AI	R N/A PPM	WELL DIAMETER 2 IN
FINAL DEPTH X. 05 FT SCREEN LENGTH	PID WELL		WELL YES NO N/A
DRAWDOWN VOLUME O, OG GAL RATIO OF (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	FT MOUTH  DRAWDOWN VOLUME PRESSURE  L VOLUME PURGED TO PUMP	IVK PSI	INTEGRITY: CAP V CASING // LOCKED V COLLAR V
PURGED 3 U.S. GAL (purge rate (milliliters per minute) x time duration (minutes) x 0	REFILL TIMER 0.00026 gal/milliliter) SETTING	N/A	DISCHARGE TIMER SETTING
TIME WATER (ft) RATE (ml/m) (deg. c)	SPECIFIC DNDUCTANCE pH DISS. O2 (ms/cm) (units) (mg/L)		PUMP INTAKE DEPTH (ft) COMMENTS
858 7.49 280 13.77 .	128 6.29 1.04	36 242 16 190	
	122 6.31 1.05	8 159	
0013 / 13.86	118 6.32 0.96	6 142	
	116 6.32 0.91	4 131	
	116 6.33 0.91	3 134	
and the second second	458		
	The state of the s		
EQUIPMENT DOCUMENTATION  TYPE OF PUMP  QED BLADDER  SIMCO BLADDER  GEOPUMP  TYPE OF TUBING  TEFLON OR TE  HIGH DENSITY  OTHER  OTHER	POLYETHYLENE STAINLESS	CHLORIDE	TYPE OF BLADDER MATERIAL  TEFLON  OTHER
ANALYTICAL PARAMETERS To Be Collected METHO NUMBER Check if requested for collection		REQUIRED	SAMPLE OLLECTED Check if collected
SVOC SVOC SVOC SVOC SVOC SVOC STO NORGANICS 6010 STO		2×1LAG 1×500,0 1×2500	VOC SVOC INORGANICS Other
PURGE OBSERVATIONS  PURGE WATER NUMBER OF GALLO	LOCATION	SKETCH	
PURGE WATER CONTAINERIZED YES NO GENERATED  NOTES			
SIGNATURE: A HU			MACTEC

PROJECT Offin (	be, baring	ריטו	SAMPLE I.I	D. NUMBER	6	W24		1	ROUND NO.
EXPLORATION ID: GU	- 1			SITE TY		A Supertu	ind	ĺ	DATE 11 14 01
IME START 043	O END	1020		JOB NUMB		1000 600 1	2.10 + 5177 = 1 1.01 <sub>2</sub>	ĺ	FILE TYPE
VATER LEVEL / PUMP S  NITIAL DEPTH TO WATER  FINAL DEPTH TO WATER  I O  DRAWDOWN VOLUME (initial - final x 0.16 (2-inct TOTAL VOL. PURGED (purge rate (milliliters per PURGE DATA TIME DEPTH TO WATER (ft)	F  2 1.2 GA  h) or x 0.65 (4-inct	T WELL DI (TOR)  T WELL DI (TOR)  T SCREEN LENGTH  LENGTH  RATIO (  TO TO  TO	DF DRAWDOWN V. VITAL VOLUME PUI  × 0.00026 gal/millil  SPECIFIC CONDUCTANCE	FT FT OLUME RGED iter)	PROTECTION CASING ST (FROM GROW) PID AMBIENT A PID WELL MOUTH PRESSURE TO PUMP REFILL TIMER SETTING	TURBIDITY	PPM PPM PSI	DIFFER WELL DIAME WELL INTEGR DISCHATIMER SETTIN PUMP INTAKE	TER IN  YES NO N/A  RITY: CAP CASING LOCKED COLLAR  ARGE
945 10.2	772 (S) - AV - 100	(deg. c) 2.79	(ms/cm) , 544	(units) 8.43	(mg/L) 8.69	25.5	-93	12.0	COMMENTS
950		2.63	,544	8.21	10.38	17.8	-89		
455		2.53	,540	8.26	10.51	5.59	-89		
000		2.46	. 238	8.27	10.75	4.24	-92		Bubbly in Cell causing.
010		2.45 U G	.537	8.26	10.83	1.71	-43		Stabilication problems
٥٨٥			w 24						
QUIPMENT DOCUMENT TYPE OF PUMP QED BLADDER SIMCO BLADDER GEOPUMP  ANALYTICAL PARAMETI BE Collected Check if requested for YOC SYOCC	I C C ERS	HIGH DENS OTHER	R TEFLON LINED  RITY POLYETHYLE  THOD  MBER  08	NE _	PE OF PUMP POLYVINY STAINLES: OTHER OTHER PESERVATION METHOD Specify QAP HCL / 4 DEC. 4 DEG. C.	L CHLORIDE S STEEL  DN VOLUM REQUIF PP Specify Q	APP	SAMPLE COLLECTED Ch	2 eck if collected
Other Ainmenia Other Other Other Other Other Other Other Other Other		35	U. /			(3500		V Oth Oth Oth Oth	er er er er er er er
PURGE OBSERVATIONS		and the state of the state of	2000		LOCATIO	N SKETCH- NOT	-1		
PURGE WATER CONTAINERIZED YES NOTES		IUMBER OF GA SENERATED	LLONS		TO P.	Pressialte revolute in t	he to	ivas fk., th	Causins bubbles
SIGNATURE:	Tol	1							MACTEC

FIELD DA	ATA REC	ORD - L	OW FLOW	GROUNDW	ATER S	AMPLIN	IG			
PROJECT	0110	, win	mingh	SAMPLE I.	. NUMBER	6	w-26		]	ROUND NO.
EXPLORATION	IID: G	w - 2	<u>ر</u>		SITE TYP	PE 5	uperfu	n en e)	]	DATE 11113107
TIME STA	ART 10:	40 EN	10 1110	5	JOB NUMB	ER 6	30006	0010	]	FILE TYPE
WATER LEVE	. —	***************************************		REMENT POINT P OF WELL RISER P OF PROTECTIVE HER	CASING	PROTECTIV CASING STI (FROM GRO	CKUP	FT	DIFFER	G/WELL
FINAL DEPTH TO WATER		. 11	FT WELL C (TOR)	N 7	<b>9</b> FT	PID AMBIENT AI	LC.		WELL	YES NO NA
	1 x 0.16 (2-inc	<b>~2</b> th) or x 0.65 (4-	inch)) TOT	OF DRAWDOWN VI		MOUTH PRESSURE TO PUMP		PPM PSI	1	CASING LOCKED COLLAR COLLAR
TOTAL VOL. PURGED (purge rate	2		GAL	) x 0.00026 gal/millili	ter)	REFILL TIMER SETTING	/		DISCH. TIMER SETTIN	
WASHINGTON TO THE	A DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
10:45	4.24	325	13.93	0.480	6.55	1.51	53.2	-84	AIM	
10:49	4.24	325	13.89	0.477	6.03	40.1	37.3	-42	1	
1c:52	4.24	325		0.469	5.99		10.3	- 80		
10:55	4.24	325	13.78	0.463	5.91	40.1	9.45	-84		
10:58	4.24	325		0.460	5.89	201	8.26	-89		
11:01	Sam	>1 <del>=</del> 6	olice	700	and the second					
	-							-	-	
	PUMP BLADDER D BLADDER	TATION		R TEFLON LINED SITY POLYETHYLE		PE OF PUMP POLYVINYL STAINLESS	CHLORIDE		TYPE OF B TEFLO OTHE	
ANALYTICAL To Be Collected  Check	L PARAMET			ETHOD IMBER	PF	RESERVATIO METHOD Specify QAP	REQUIR	ED 9	SAMPLE COLLECTED	Deck if collected
VOC SVOC INORG NORG Other	BANICS DISS	chem	827 601 <b>3</b>	5c ·1 5c ·0 / 281	>/25	HCL /4 DEG 4 DEG, C 4 DEG, C	3 X 40 mL 2 X 1 L AG		SA SA SA SA SA SA SA SA SA SA SA SA SA S	C OC
PURGE OBS		s				LOCATION	SKETCH			
PURGE WATE CONTAINERIZ NOTES		(NO)	NUMBER OF G GENERATED	ALLONS						
SIGNATURE:	o,	~~~								MACTEC

FIELD DATA RECORD - LOW F	LOW GROUNDW	ATER SAM	MPLING			
PROJECT 51 Echnes 5	SAMPLE I.I	D. NUMBER	cw . 4	25		ROUND NO.
EXPLORATION ID: GW · 425		SITE TYPE	Super	fund		DATE 11/12/07
TIME START 11:35 END 15	2:25	JOB NUMBER	630006	0010	FILE	TYPE /
WATER LEVEL / PUMP SETTINGS	MEASUREMENT POINT TOP OF WELL RISER TOP OF PROTECTIVE OTHER	CASING CAS	OTECTIVE SING STICKUP OM GROUND)	FT	PROTECTIVE CASING / WELL DIFFERENCE	L / FI
TOWATER 3.44 FT	(TOR) 17.	93 PID AME	BIENT AIR 2	2. ( PPM	WELL DIAMETER	<b>2</b> IN
FINAL DEPTH TOWATER 3. 70 FT	SCREEN /	0.000	WELL 40	· \ PPM	WELL INTEGRITY:	YES NO N/A
DRAWDOWN VOLUME (initial - final x 0.16 (2-inch) or x 0.65 (4-inch))	RATIO OF DRAWDOWN V	OLUME PRE	ESSURE PUMP	PSI	CAS LOCI COL	SING 🔀 🔚
PURGED H-6 GAL (purge rate (milliliters per minute) x time duration	n (minutes) x 0,00026 gat/mittil	TIMI			DISCHARGE TIMER SETTING	/
TIME WATER (ft) RATE (ml/m) (de	SPECIFIC EMP. CONDUCTANCE eg. c) (ms/cm)	(units) (n	SS. O2 TURBID	(mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
	.51 0.228		0.1 12.7	- 154	N	- INDINE
	·54 0·239	4.926		to Constant		
	67 0.254	4.932		·		
	68 0 . 258		-1 5.8			
12:17	69 0.260	4.95	40.1 5.0			
12:20 Scarpia						
- 4 - 4						
GED BLADDER T	OF TUBING  EFLON OR TEFLON LINED  IGH DENSITY POLYETHYLE  STHER LPPE  METHOD NUMBER  8260B 8270 6010 300.0/251	PRESE ME Spe HCL 4 DE 4 DE 4 DE	ETHOD Edity QAPP Sp L/4 DEG. C SG. C EG. C SG. C	VOLUME	SAMPLE OTHER  Check if co SVOC INORGANI Other Other Other Other Other Other	Nlected
PURGE OBSERVATIONS	· V	LO	CATION SKETCH			
	BER OF GALLONS FRATED					
NOTES STRONG SULL	fur owler hue to water					
SIGNATURE	_	_				MACTEC

FIELD DATA R	ECORD - L	OW FLOW	GROUNDW	ATER S	AMPLIN	G				
PROJECT 01	iw, wi	, monda	SAMPLE I.	D. NUMBER	G	- 555			ROL	JND NO.
EXPLORATION ID:	GW . 55	5		SITE TYP	5 (0x50)	Pe+ Fuy	<b>~</b>	]	DATE [	11/13/07
TIME START 1	5:20 EN	0 15:5	5	JOB NUMB		000 600			FILE TYPE	
WATER LEVEL / PUM INITIAL DEPTH TO WATER	2.65	<b>≥</b> 10 10	REMENT POINT P OF WELL RISER P OF PROTECTIVE HER	CASING	PROTECTIVE CASING STIC (FROM GROU	IND)	FT.	PROTEC CASING DIFFERE	/WELL	/ FT
FINAL DEPTH TO WATER	2.91	(TOR)  FT SCREE LENGT	N [		AMBIENT AIR	40.1	• PPM	DIAMETE WELL	Y	ES NO N/A
(initial - final x 0.16 (	2-inch) or x 0.65 (4-	GAL RATIO	OF DRAWDOWN V	RGED	MOUTH PRESSURE TO PUMP REFILL TIMER SETTING		PPM	DISCHAPTIMER SETTING	CASING LOCKED COLLAR	
PURGE DATA  TIME DEPTH TO  TIME WATER (*)  15:24 2.9  15:30 2.9  15:35 2.9  15:36 2.9  15:37 2.9  15:37 2.9  15:37 2.9  15:37 2.9  15:42 2.9	RATE (ml/m) RATE (	TEMP. (deg. c) 11.37 11.40 11.45 11.50 11.55 11.55	SPECIFIC CONDUCTANCE (ms/cm)  1. LLL  1. S1  1. CZ  1. Tq  1. QLL  2. OS  2. 11	4.16	20. \ 20. \ 20. \ 20. \	TURBIDITY (ntu)  ZO 7  12.7  Q.92  8.21  4.62  4.48  3.67	REDOX (mv) 332 310 295 280 272 261 257	PUMP INTAKE DEPTH (ft)	СОММЕ	NTS
15:45 2.91	400	11.56	2.20	4.34	۷٠.١	3.25	251			
15:50 Sc	whic.	collec	-							
EQUIPMENT DOCUM  TYPE OF PUMP  QED BLADDER  SIMCO BLADDI  GEOPUMP  ANALYTICAL PARAN To Be Colected  Check if request  VOC SVOC INORGANICS Other Other Other Other Other	METERS  ed for collection	HIGH DENS  ME NU  826 827 601	R TEFLON LINED SITY POLYETHYLE L DPE ETHOD MBER  08	NE PR	PE OF PUMP M POLYVINYL OF STAINLESS: OTHER RESERVATION METHOD Specify QAPP HCL / 4 DEG. C 4 DEG. C	VOLUM REQUIR Specify QA C 3 X 40 mL 2 X 1 L AG	APP (	SAMPLE COLLECTED Chec Svoc	k if collected	AL
OtherOther								Other_		
NOTES EP	calle captes	fer:	SPLIT Vocs,	-	LOCATION	<b>БКЕТСН</b>				
SIGNATURE:	DISS V	resals		-					M	MACTEC

SERVICIATION DE CAU-105 STETTYPE SUPERFUED DATE 111  TIME STATE 111:30 DID 12:107 JORNUMBER 6:30006,0010 FRE TYPE  WATER LEVEL, PUMP SETTINGS  WALEAUR LEVEL, PUMP SETTINGS  COLOR JAMES AND SETTINGS  WALEAUR LEVEL, PUMP SETTINGS  WALEAUR LEVEL, PU	FIELD C	DATA RI	ECORD -	LOW F	LOW	GROUNDW	ATER S	AMPLIN	IG			
MATER LEVEL   PUMP SETTINGS	PROJECT	0111	, wi	) pro i b	910	SAMPLE I	D. NUMBER	61	~-105		)	ROUND NO.
WATER LEVEL PUMP SETTINGS  WALDERTH SORT ALL REPORT  WATER LEVEL PUMP SETTINGS  WALDERTH SORT ALL REPORT  ONTIAL CEPTH  TO WATER  8.90  F)  WELL DEPTH  TO WATER  R. TO COMMODINI	EXPLORATI	ON ID:	cw-	105			SITE TY	PE Su	perfur	اله-		DATE 1111310
PROTECTIVE PROTECTIVE CASHON PROTECTIVE CASHOS STICKED CASHOS STIC	TIME	START 11	1:30	END 1-	2100		JOB NUMB	ER 63	000600	-10	F	ILE TYPE
11:38	FINAL DEP TO WAT FINAL DEP TO WAT! DRAWDOW VOLUM (initial - 1 TOTAL W. PURG (purge ra	PTH ER STATE OU.	3 . 90 2 . 75 3 per minule) x tr	GAL (4-inch)) GAL (4-inch)) GAL (4-inch)) GAL (4-inch)) GAL (4-inch))	WELL DO (TOR)  SCREEN LENGTH  RATIO ( (minutes)	OF WELL RISER OF PROTECTIVE HER  EPTH Q.O  OF DRAWDOWN V  DTAL VOLUME PU  O C O Q (  X 0.00026 gal/milli  SPECIFIC  CONDUCTANCE (ms/cm)	FT F	CASING STI (FROM GRO PID AMBIENT AI PID WELL MOUTH PRESSURE TO PUMP REFILL TIMER SETTING	TURBIDITY (ntu)	PPM PSI REDOX (my)	CASING / WOLFERENCE WELL DIAMETER WELL INTEGRITY ( L C DISCHARG TIMER SETTING PUMP NTAKE	VELL FT  Z IN  YES NO N/A CASING Y CASING Y COCKED Y COCK
11:45				-		A	- Ne		TOTAL VIEW CONTRACTOR			
11:49 8 95 325 13.50 0.133 3.95 20.1 0.42 190  11:51 8.95 325 13.50 0.133 3.95 20.1 0.42 190  11:51 8.95 325 13.50 0.132 3.91 20.1 0.42 190  12:00		-		-			-					
11:51   8:95   325   13:80   0.132   3:91   0.1   0.42   191     12:00			-				to the same of the			The second		
TYPE OF FUND   TYPE OF FUND MATERIAL   TYPE OF BLADDER MATERIAL   TYPE OF	11:51	8.95	A STATE OF THE STA	1	2100 23				0.32	192		
EQUIPMENT DOCUMENTATION  TYPE OF PUMP MATERIAL  TYPE OF PUMP MATERIAL  TYPE OF BLADDER MATERIAL  GED BLADDER  TEFLON OR TEFLON LINED  POLYMNYL CHLORIDE  SIMCO BLADDER  METHOD  GEOPUMP  OTHER  METHOD  PRESERVATION  METHOD  SPOOD  ONE  OTHER  PRESERVATION  METHOD  SPOOD  OTHER  METHOD  SPOOD  SPOOD  SPOOD  SPOOD  SPOOD  SPOOD  SPOOD  SPOOD  OTHER  METHOD  SPOOD  SPO	11:54	8.95	325	13.	58	0.132	3.97	20.1	0.47	196		
TYPE OF PUMP MATERIAL  GED BLADDER  TEFLON OR TEFLON LINED  SIMCO BLADDER  HIGH DERISITY POLYETHYLENE  GEOPULIP  TOTHER   ANALYTICAL PARAMETERS  Ge Codeded  Check if requisted for collection  NUMBER  METHOD  SYOC  SY	12:0	0	Samp	×								
TYPE OF PUMP MATERIAL  GED BLADDER  TEFLON CR TEFLON LINED  POLYMNYL CHLORIDE  TEFLON  TEFLON  TEFLON  TEFLON CR TEFLON LINED  POLYMNYL CHLORIDE  TEFLON  TOTHER  TEFLON  TOTHER  TEFLON  TOTHER  TEFLON  TOTHER  TEFLON  TOTHER  TOTH												
TYPE OF PUMP MATERIAL  GED BLADDER  TEFLON OR TEFLON LINED  SIMCO BLADDER  HIGH DERISITY POLYETHYLENE  GEOPULIP  TOTHER   ANALYTICAL PARAMETERS  Ge Codeded  Check if requisted for collection  NUMBER  METHOD  SYOC  SY			-	-	-		-		Manufacture 1	-		
PURGE WATER  CONTAINERIZED YES NO GENERATED  NOTES  EPA SPLIT SAMPLES COllected  For: VCC5 / SUCC5 , America,  WCT Chem , DSS Mesols	TYPE Q  SIA SIA SE  ANALYTIC To the Confector SYC	DE PUMP DE BLADDER NICO BLADDER	METERS  and for collection	TE HII	GH DENS GH DENS THER ME NU 8284 8270 8010	THOD MEER  DE COMMENT OF THE COMMENT	PI 2510	POLYMNYN  STAINLESS  OTHER  RESERVATIC  METHOD  Specify DAP  HCL / 4 DEG. C  4 DEG. C	ON VCLUM REQUIF	APP	SAMPLE COLLECTED Check: VOC SVOC INCRG: Other Other Other Other Other Other Other	if collected
NOTES  EPA SPINT samples collected  for: vecs , succs , Ammonia,  werehem, bis mesols			SNC	NUMBE	ER OF GA	ALLONS		LOCATION	SKETCH			
ISIGNATURE: MAC	CONTAINE	EPA for	split; vac	SON S / S	WEC SS	s colle	reni	- 4 )				MACTEC

FIELD DATA RECORD - LOW FLOW G	ROUNDWATER SAM	IPLING	
PROJECT Olin, Wilmington	SAMPLE I.D. NUMBER	GW. 765	ROUND NO.
EXPLORATION ID: GW-765	SITE TYPE	Superfund	DATE IIIS POT
TIME START 14:00 END 14:40	JOB NUMBER	63000 60c 10	FILE TYPE
INITIAL DEPTH TO WATER TO WATE	PROTECTIVE CASING (FROM	DIECTIVE SING STICKUP OM GROUND)  FT  SIENT AIR  WELL  TH  PPM	PROTECTIVE CASING / WELL DIFFERENCE  WELL DIAMETER  Z IN  WELL YES NO N/A
(initial - final x 0.16 (2-inch) or x 0.65 (4-inch)) TO TOTA	L VOLUME PURGED TO I	issure Pump Psi	CASING COLLAR CO
TIME WATER (ff) RATE (ml/m) (deg. c) 14:03 7.73 350 13.84 9 14:06 7.73 350 13.86 0 14:12 7.73 350 13.82 0 14:12 7.73 350 13.82 0 14:15 7.73 350 18.85 0 14:25 7.73 350 13.70 0	(ms/cm) (units) (m 0 . 196 5.89 4 2 . 206 5.79 4 2 . 218 5.75 4	0.1 150 86 0.1 126 85 0.1 82.5 84 0.1 41.0 91	PUMP INTAKE DEPTH (ft) COMMENTS
GEOPUMP OTHER L  ANALYTICAL PARAMETERS To Be Collected METHO	POLYETHYLENE STA	LYVINYL CHLORIDE   UNILESS STEEL   HER	TYPE OF BLADDER MATERIAL  TEFLON  OTHER  SAMPLE
Check if requested for collection  VOC 8250B SVOC 8270 INORGANICS 6010  Other	Spec HCL 4 DE 4 DE	cify QAPP Specify QAPP  /4 DEG. C 3 X 40 mL  GG. C 2 X 1 L AG  GG. C	Check if collected  VOC SVOC INORGANICS Other Other Other Other Other Other Other Other
PURGE OBSERVATIONS PURGE WATER CONTAINERIZED YES NO GENERATED NOTES	1713023	CATION SKETCH	,
Succe, Ammania chem + Diss m	vecs, , ves		MACTEC

TIME START 1):00 END 11:25  WATER LEVEL / PUMP SETTINGS  MEASUREMENT POINT TOP OF WELL RISER TOP OF PROTECTIVE CASING STICKUP (FROM GROUND)  FILE TYPE  FROM GROUND  FILE TYPE  CASING STICKUP  FR	
TIME START 1):00 END 11:25  WATER LEVEL / PUMP SETTINGS  MEASUREMENT POINT TOP OF WELL RISER TOP OF PROTECTIVE CASING OTHER TOWN OF PROTECTIVE CASING STICKUP (FROM ROOUN) (FR	NO.
TIME START 1):00 END 11:25 JOB NUMBER 6 300 COC 10  WATER LEVEL / PUMP SETTINGS  MEASUREMENT POINT TOP OF WELL RISER TOP OF PROTECTIVE CASING OTHER TOP OF PROTECTIVE CASING OTHER CASING STICKUP (FROM GROUND) FIT  PROTECTIVE CASING WIFLL DIFFERENCE  PROTECTIVE CASING STICKUP (FROM GROUND) FIT  OWATER FIT TO WATER FIT SCREEN FIT SCREEN FIT MOUTH	112107
PROTECTIVE CASING PROTECTIVE CASING PROTECTIVE CASING PROLE CASING STICKUP (FROM GROUND) FT  INITIAL DEPTH TO WATER FT WELL DEPTH TO WATER FT SCREEN FT SCREEN FT WOUTH MOUTH WOULL WELL YES NTEGRITY: CAP X NOUME (initial-final x 0.16 (2-inch) or x 0.65 (4-inch)) TO TOTAL VOLUME PURGED [purge rate (milliflers per minule) x time duration (minules) x 0.00026 gal/millifler)  PURGE DATA TIME  DEPTH TO PURGE TEMP. CONDUCTANCE PURGED (implem)  TO DEPTH TO PURGE WATER (ft) RATE (milm) (deg. c)  TYPE OF PUMP  TYPE OF PUMP  TYPE OF PUMP  TYPE OF PUMP TYPE OF PUMP TYPE OF PUMP MATERIAL  TYPE OF BLADDER MATERIAL	
TYPE OF PUMP TYPE OF TUBING TYPE OF PUMP MATERIAL TYPE OF BLADDER MATERIAL	FT IN NO N/A
TYPE OF PUMP TYPE OF TUBING TYPE OF PUMP MATERIAL TYPE OF BLADDER MATERIAL	
TYPE OF PUMP TYPE OF TUBING TYPE OF PUMP MATERIAL TYPE OF BLADDER MATERIAL	
TYPE OF PUMP TYPE OF TUBING TYPE OF PUMP MATERIAL TYPE OF BLADDER MATERIAL	
OED BLADDER	
PURGE OBSERVATIONS PURGE WATER CONTAINERIZED YES NO GENERATED  NOTES  SIGNATURE:  LOCATION SKETCH  LOCATION SKETCH	ACTEC

FIELD DA	ATA RE	CORD	- LOW	/ FLOW	GROUNE	OWATER S	SAMPLIN	G			
PROJECT	0111	n , w	niic	ינים	SAMP	LE I.D. NUMBER	i 🗀	P-2-U		]	ROUND NO.
EXPLORATION	N ID:	18-5	2 - 4	<u> </u>		SITE TY		operfur		]	DATE 11/12/07
TIME ST.	TART 11	:25	END	11130		JOB NUMB	BER 63	<del>-</del> ∞6∞	10	]	FILE TYPE
INITIAL DEPTH TO WATER FINAL DEPTH TO WATER DRAWDOWN VOLUME	H R	SEITINGS	S FT GAL	WELL D (TOR) SCREEN	N	SER TIVE CASING FT	PROTECTIVE CASING STIC (FROM GROU PID AMBIENT AIR PID WELL MOUTH PRESSURE	CKUP UND)	PPM PPM	DIFFER WELL DIAMET	RENCE FT
(initial - fina TOTAL VOL PURGED	al x 0.16 (2-ii	or x 0.6.	65 (4-inch))		OTAL VOLUME () x 0.00026 gal/	EPURGED	TO PUMP REFILL TIMER SETTING		PSI	DISCHA TIMER SETTIN	COLLAR 🗏 🗌
	DEPTH TO WATER (ft)	PURG RATE (m	USP CALL	TEMP. (deg. c)	SPECIFIC CONDUCTAN (ms/cm)	Control of Control	DISS, O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
SIMCO	F DOCUME PUMP BLADDER CO BLADDER PUMP AL PARAMI K if requested GANICS F T T T T T T T T T T T T T T T T T T T	ETERS and for collection	on Num	HIGH DENS OTHER ME NU 8266 8276 6016	R TEFLON LINI SITY POLYETH LDPE  ETHOD IMBER  0 0 0 5 5 7 7 7 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	ED	PE OF PUMP POLYVINYL STAINLESS OTHER PRESERVATION METHOD Specify QAPI 4 DEG. C 4 DEG. C	N VOLUM P Specify QA .C 3X40 mL 2X11 AG	ED NPP	SAMPLE COLLECTED Chi	eck if collected  C  DC  RGANICS  er  er  er  er  er  er  er
SIGNATURE:	9	œ		10							MACTEC

FIELD	DATA	RECO	RD - LOV	V FLOW	GROUNDW	ATER S	AMPLIN	3				
PROJECT	Oli	1			SAMPLE I.I	D. NUMBER	64	1 42 d		]	ROUND NO.	
EXPLORA	START  ER LEVEL / PUMP SETTINGS  AL DEPTH O WATER  AL DEPTH O WATE	4364	20		SITE TY	PE			DATE 11 /2 27			
TIME	START		END	11:3	0	JOB NUMB	ER			]	FILE TYPE	
WATER I	EVEL / PI	UMP SET	TINGS		JREMENT POINT OP OF WELL RISER OP OF PROTECTIVE	CASING	PROTECTIVE CASING STIC (FROM GROU	KUP	FT	PROTEC' CASING / DIFFERE	WELL	]
TO WA	TER _	3, 38	F		DEPTH	FT	PID AMBIENT AIR		РРМ	WELL		ET IZ
TO WA	TER		FI	SCREE	5000	FT	PID WELL MOUTH		РРМ	WELL	YES NO	N/A
VOLU (initial	JME - final x 0.16	i (2-inch) c	GA or x 0.65 (4-inch		OF DRAWDOWN VI		PRESSURE TO PUMP		PSI	]	CASING LOCKED COLLAR	$\equiv$
PUR	GED _	ers per mir	GA nule) x time dur		s) x 0.00026 gal/millili	ter)	REFILL TIMER SETTING			DISCHAR TIMER SETTING		
PURGE D	DEPTH			TEMP. (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS	
				-119111								
TYPE	OF PUMP ED BLADDI IMCO BLAD	ER			NG OR TEFLON LINED ISITY POLYETHYLE	₫	PE OF PUMP N POLYVINYL (  STAINLESS S  OTHER	CHLORIDE	31	TYPE OF BLA	ODER MATERIAL	
ANALYT	CAL PAR	AMETER	s		ETHOD	- L	RESERVATION	VOLUM		SAMPLE		
_ c	heck if requ	ested for c	ollection	N	UMBER		METHOD Specify QAPP	REQUIR	RED	COLLECTED	k if collected	
	/OC ORGANICS	6		82 82 60			HCL / 4 DEG. 4 DEG. C 4 DEG. C	C 3 X 40 mL 2 X 1 L AC		VOC SVOC INOR	GANICS	
	ther				1			= ==		Other Other Other		
	therther			Z					_	Other Other Other		=
A A	DBSERVA	TIONS				T	LOCATION	KETCH	-	Other		_
PURGE W CONTAIN		YES (		JMBER OF C ENERATED	SALLONS							
NOTES												
		70										
SIGNATU	RE: A	d	w	-							MACTE	C

FIELD	DATA RE	CORD - LO	OW FLOW	GROUNDW	ATER S	SAMPLI	NG			
PROJECT	Olinh	Vibripe	-207	SAMPLE I.	D. NUMBER	2 B	<b>'</b> - §		]	ROUND NO.
EXPLORAT	7	3-3			SITE TY	PE SV	pretint		]	DATE / 15 07
TIME	START / 4	W EN	01455		JOB NUME	BER 6	7006001	_	]	FILE TYPE
WATER L	EVEL / PUMP	SETTINGS	To	REMENT POINT OP OF WELL RISER OP OF PROTECTIVE		PROTECTIVE CASING ST	VE CICKUP		PROTEC	/WELL
INITIAL DE TO WA		.01	FT WELL C	DEPTH /	FT	PID AMBIENT A		FT PPM	WELL	
FINAL DE TO WA	TER 13	35	FT SCREE		FI	PID WELL	0.0	РРМ	WELL	YES NO N/A
DRAWDO VOLU (initial -	JME .	05 nch) or x 0.65 (4-1)	GAL RATIO	OF DRAWDOWN V	OLUME	PRESSURE TO PUMP	/	PSI	]	CASING LOCKED COLLAR
TOTAL 1 PUR (purge	GED 5.		GAL duration (minutes	. <i>O )</i> s) x 0.00026 gal/millili	iter)	REFILL TIMER SETTING	/		DISCHAI TIMER SETTING	
PURGE D	DEPTH TO WATER (ft)	PURGE RATE (ml/m)		SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS. O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
1430	13.35	320	15.85	2:10	5.87	6.41	7.76	123		
1435		-	15.81	235	5.89	4,22	250	139		
1440		-	15.81	240	5.91	4.16	2.01	142		
1445		-	15.82	239	5.42	1,95	×1.	144		
1455			15.80.	241	101	4.06	< 1	152		
	in.	14 14	12.00.	S/ 11.1	١, ١	7.00		(32		
TYPE I	heck if requested OC /OC ORGANICS her	ETERS  If for collection	HIGH DEN.  OTHER 1.  ME NL  826 601	OR TEFLON LINED SITY POLYETHYLE STORY POLYETHYLE STORY	NE C	PRESERVATION SPECIFY OAF HCL / 4 DEG. C	L CHLORIDE S STEEL  ON VOLUM REQUIR PP Specify Q/	APP	SAMPLE COLLECTED Chee	ck if collected  GRGANICS
PURGE (	DBSERVATION	NS			T	LOCATIO	N SKETCH			
PURGE W CONTAINS		s 😡	NUMBER OF G GENERATED	ALLONS						
NOTES		* * *		# F						
SIGNATUI	RE: 5	Pu	1							MACTEC

FIELD	DATA RE	CORD - LO	OW FLOW	GROUNDW	ATER S	SAMPLIN	IG			
PROJECT	osis	n, wi	ranina	SAMPLE I.	D. NUMBER	6	w.13			ROUND NO.
EXPLORAT	TON ID: 6	w-13			SITE TY	PE 5	perfur	·d		DATE 11115107
TIME	START 12	HI EN	D		JOB NUME	BER 63	500060	010	]	FILE TYPE
WATER L	EVEL / PUMP	SETTINGS	TO TO	IREMENT POINT OP OF WELL RISER OP OF PROTECTIVE		PROTECTIV CASING STI (FROM GRO	CKUP	F	CASIN	ECTIVE G/WELL RENCE FT
TO WA		2.41	FT WELL (TOR)	DEPTH 19.6	30 FT	PID AMBIENT AI	R 401	PPN	WELL	TER 42 4 IN
FINAL DE TO WA	0.00000	5.97	FT SCREE			PID WELL	40.1		WELL	YES NO N/A
DRAWDO VOLU (initial -	2.20			OF DRAWDOWN V		PRESSURE TO PUMP		PPM PS	7	CASING X LOCKED COLLAR
DESTRUCTURES.	GED rate (milliliters pe		GAL duration (minutes	s) x 0.00026 gal/millil	liter)	REFILL TIMER SETTING			DISCH TIMER SETTIN	
PURGE D	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	(units)	DISS, O2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (ft)	COMMENTS
12:40	13.31	275	15.19		4.50	0.81	5.90	80	44	
12:46		275	// III - III	0.036	Contract ANN AND	ومع	5.40	86	1	
12:49	13.74	275	P. J. Street,	0.036	100	e .67	5.3z	62		
12:52	13.81	-	TO Section 1	0.036		c. 20	4.43	39 .		
12:55		275		0.036		56	3.72	32		
The second second	13.94	275	15.05	0.036	4.48	0.70	2.66	Z9	1	
13:00	Sean	Pie							-	
									1	
TYPE C	INT DOCUMEN DE PUMP ED BLADDER MCO BLADDER EOPUMP			R TEFLON LINED SITY POLYETHYLE		PE OF PUMP POLYVINYL STAINLESS OTHER	CHLORIDE		TYPE OF B TEFLO OTHER	
To Be Collecte	eck if requested	3072043		ETHOD JMBER	P	RESERVATIO <u>METHOD</u> Specify QAP	REQUIR	RED	SAMPLE COLLECTED	2 eck if collected
O#	OC DRGANICS ner	***	826 827 601	0		HCL /4 DEG 4 DEG, C 4 DEG, C	3 X 40 mL 2 X 1 L AC		Oth Oth Oth Oth Oth Oth Oth	OC ORGANICS  er er er er er er er er
	BSERVATION	IS.	- ×-			LOCATION	SKETC!!		Oth	er
PURGE WA	ATER	er er <del>er er</del>	NUMBER OF G GENERATED	ALLONS		LOCATION	SKETCH			
NOTES										
SIGNATUR	F: 🚗	_	سيسن							MACTEC

FIELD D	ATA REC	CORD - LO	W FLOW	GROUNDW	ATER S	AMPLI	NG				
PROJECT	olin	wilm	117974	SAMPLELI	). NUMBER	cu	- Iu	.10	]	ROUND NO.	
EXPLORATION	ON ID: 3	w·10			SITE TY	PE £	uperfur	-cf	]	DATE 11	115107
TIME [	START   1 :	3a EN	12:10		JOB NUMB	ER 6	3000600	10	] .	FILE TYPE	
WATER LE	VEL / PUMP :		701 101 011	REMENT POINT P OF WELL RISER P OF PROTECTIVE HER	CASING	PROTECTIVE CASING ST	ICKUP	FT	PROTECTI CASING / I DIFFEREN	WELL	FI
TO WATE	ER	12.59	FT WELL O	EPTH ZI.	24	PID AMBIENT A	IR 20.1	PPM	WELL DIAMETER	,	12
TO WAT			FT SCREE		FT	PID WELL MOUTH		) PPM	WELL		O N/A
DRAWDOW VOLUM (initial - f	E	th) or x 0.65 (4-i		OF DRAWDOWN V		PRESSURE TO PUMP		PS	1	CASING >	ΞΞ
TOTAL VI PURG (purge ra	ED		SAL duration (minutes	) x 0.00026 gal/millil	ler)	REFILL TIMER SETTING			DISCHARO TIMER SETTING	SE /	
PURGE DA	DEPTH TO WATER (ft)	PURGE RATE (ml/m)	TEMP. (deg. c)	SPECIFIC CONDUCTANCE (ms/cm)	pH (units)	DISS, D2 (mg/L)	TURBIDITY (ntu)	REDOX (mv)	PUMP INTAKE DEPTH (h)	COMMENTS	
11:35	12.7%	300	15.79	0.352	5.84	0.84	167	-9			
2/2 102	12.76	300	15.67	0.338		0.98	125	-11			
11:41	12.76	300	15.68	0.334	5.89		115	-13			
11:47	12.79	300	15.56		5.8		108	-11			
11:50	12.79	300	15.56		5.84	-	100	-5			
11:55	Sew										
TYPE O	NT DOCUMEN F PUMP D BLADDER MCO BLADDER OPUMP	NOITATION		NG R TEFLON LINED SITY POLYETHYLE		PE OF PUMI POLYVINY STAINLES OTHER	LCHLORIDE		TYPE OF BLAG	DER MATERIAL	
fo Be Collected Ch	eck if requested  C  DC  RGANICS  er  er  er  er  er		NL		P	RESERVATION METHOD Specify QAI HCL / 4 DEG. C 4 DEG. C	PP Specify Co	APP	voc svoc	if collected	
Oth	er								Other_Other_		
PURGE OF CONTAINE			NUMBER OF G GENERATED	ALLONS		LOCATIO	N SKETCH				
NOTES	E: -	2000								MAC	rec

FIELD	DATA	REC	CORD - LO	OW F	LOW	GRO	WDNU	ATER S	SAMPLIN	G			Communication of the Communica	
PROJECT	_ <	>111	۸, سز	144	12.8.	10 1	SAMPLE I.	.D. NUMBER	G	w-16		]	ROUND NO.	]
EXPLORAT	TION ID:	G	w - 1L					SITE TY	PE Su	perfun	<b>~</b>	]	DATE 11/15/03	
TIME	START	8:	SS EN	D )!	1:00	,		JOB NUMB	ER 63	ece600	lo	]	FILE TYPE	1
INITIAL DE TO WAT FINAL DEI TO WAT	PTH [		· 35	FT	WELL D (TOR)	P OF PR HER DEPTH [	T POINT ELL RISER ROTECTIVE	S FT	PROTECTIVE CASING STIC (FROM GROU PID AMBIENT AIF	UND)	FT PPM	WELL DIAMETER	R YES NO N/A	A
TOTAL \	IME [ - final x 0.*  VOL. [ GED	2107.50000	th) or x 0.65 (4-i	GAL	101	OF DRA	WDOWN V OLUME PU 026 gal/millil	IRGED	PRESSURE TO PUMP REFILL TIMER SETTING	/	PPM PSI	]		
PURGE D TIME 9:10 9:13 9:14 9:19 9:22 9:25	DEPT WATE 11. 12. 12. 12. 12. 12. 12.	84 64 .11 19 20 24	PURGE RATE (ml/m) 250 250 250 250 250 250 250	16 16 16 16	EMP. eg.c) • 78 • 81 • 83 • 84 • 88	CONDI (m	ECIFIC UCTANCE INS/CM) . 185 . 171 . 166 . 164 . 162	pH (units) 5.32 5.20 5.14 5.03 5.11 5.10	5.37 5.22 5.19 4.74	TURBIDITY (ntu) 57.2 29.3 15.0 10.7 9.61 8.94	REDOX (mv) 103 86 89 89 95	PUMP INTAKE DEPTH (ft)	COMMENTS	
ANALYTII To Be Colecte  CH  VO  SIN  Oth  Oth  Oth  Oth  Oth  Oth  Oth  Ot	OF PUMP ED BLADI MCO BLA EOPUMP CAL PA ed heck if reco	DER ADDER RAMET quested f		те	THER	ETHOD JMBER	ON LINED	ENE	PE OF PUMP!  POLYVINYL  STAINLESS  OTHER  RESERVATION METHOD Specify QAPP HCL/4 DEG. C 4 DEG. C	CHLORIDE STEEL  N VOLUM REQUIF Specify Q	RED DAPP	SAMPLE COLLECTED Check	GANICS	
Ott	DBSERV ATER ERIZED	YES	s NO MS	GENE				.\\eo	LOCATION	SKETCH		Other_		

FIELD DATA REC	CORD - LOW F	LOW GI	ROUNDW	ATER S	AMPLIN	G			
PROJECT Olin	4-		SAMPLE I.C	). NUMBER	I	N-6			ROUND NO.
EXPLORATION ID:	w - 6			SITE TYP	SJ/	ertund			DATE 11 15 07
TIME START 123	5 END 13	'40		JOB NUMB	ER 365				FILE TYPE
DRAWDOWN /	(5 п IJ п	WELL DEPT (TOR) SCREEN LENGTH	TH	FT FT	PROTECTIVE CASING STIC (FROM GROD PID AMBIENT AIR PID WELL MOUTH	JND) [,0	FT PPM PPM	WELL DIAMET WELL	S/WELL FT
(initial - final x 0.16 (2-inc	33 GAL	O.C	DRAWDOWN VO AL VOLUME PUR 0.00026 gal/millili	RGED	PRESSURE TO PUMP REFILL TIMER SETTING	MA	PSI	DISCHA TIMER SETTIN	
DEPTH TO WATER (ft)  1300 12.12  1305  310   3212  1305  320   330	RATE (ml/m) (d 320 i4, i4, i4, i4, i4 i4 i4 i4 i4 i5 i7	eg. c)  2 2 1  2 4 1  2 4 1  2 4 1  2 5 1  2 8 1  2 1  OF TUBING	OD LER	6.46 6.46 6.46	DISS. 02 (mg/L) 1.47 1.23 0.95 0.81 0.76 0.71 U.74  PEOF PUMP POLYVINYL STAINLESS OTHER  RESERVATION METHOD Specify QAPI HCL/4 DEG. C 4 DEG. C	N VOLUM REQUIR P Specify QA C 3 X 40 III 2 X 1 L AG ( + 1 S Q Q 1 X 5 Q Q	ED 9	SAMPLE COLLECTED Che	eck if collected  COC  RGANICS  or  er  er  er  er  er
NOTES	ill								MACTEC

FIELD DATA RECORD - LOW FLOW G	ROUNDWATER SAM	MPLING	
PROJECT Din WilmingTon	SAMPLE I.D. NUMBER	En 101	ROUND NO.
EXPLORATION ID: GW 101	SITE TYPE	EPA SupertunA	DATE 11 15 07
TIME START 11 15 END 1200	JOB NUMBER	6300060010	FILE TYPE
INITIAL DEPTH TO WATER (ft) PURGE TEMP.  TOP CONTROL TOP CONTROL TOP CONTROL TOP CONTROL TOP CONTROL TOP CONTROL TEMP.  TOP CONTROL TOP CONTROL TOP CONTROL TOP CONTROL TEMP.  TOP CONTROL	PTH FT PID AME  FT PRAWDOWN VOLUME PREFAL VOLUME PURGED TO 0.00026 gal/milliliter)  SPECIFIC CONDUCTANCE PH DIS (ms/cm) (units) (fr	BIENT AIR  DIWELL  OF COMPANY  PPM  ESSURE  PUMP  FILL  A  PM	PROTECTIVE CASING / WELL DIFFERENCE  WELL DIAMETER  WELL VES NO N/A INTEGRITY: CAP CASING LOCKED COLLAR DISCHARGE TIMER SETTING  PUMP INTAKE DEPTH (tt)  CASING COMMENTS
		93 6.40 -90	
		91 7.17 -89	
		53 6.91 -92	
14.65 1		43 6.54 -90	
1130 %	.19 6.50 2.	.41 7.14 -91	
1200 Sample			
SIMCO BLADDER HIGH DENSIT	TEFLON LINED PO POLYETHYLENE ST.  I) PE OT  HOD PRESI BER ME Spe HOD 4 D 4 D	DLYVINYL CHLORIDE  'AINLESS STEEL  THER  ERVATION VOLUME	TYPE OF BLADDER MATERIAL  TEFLON  OTHER  SAMPLE COLLECTED  Check if collected  VOC SVOC INORGANICS  Other Other Other Other Other Other Other
OtherOther	1100.00	OCATION SKETCH	OtherOther
NOTES  SIGNATURE: A L H			MACTEC

### **APPENDIX B**

## **Chains of Custody**

## **FestAmerica Laboratories, Inc.**

Chain of C tody Form



•53 Southernes Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

Client: Olin Chemical/MACTEC		P	roject#	1	,30	00	06	00	10	18	31	. 1	٦ ا	ob#					麗 製	uote		PO#
Address: 51 Eames Street	7.4 × 100	Project M								NAME OF THE OWNER, OWNER, OWNER, OWNER, OWNER, OWNER,				Marie Co. N	ded	the second	100	Carly and Line	e-Manne		se .	Comments
Wilmington, MA 01887			Vork ID					V.	1					heck	Ana			The Carlotte			d	(Special Instructions)
		SHIPS THE SAME		S. Carrie	(3) (A)								а	nd an	alyte	STANISH NA		CONTRACTOR OF THE PARTY OF THE	ets.billo			MOD
Phone: Fax:		Regulatory C	Contact					ol Da	nor	+ E o	·rm	<b>a</b> t	F	or exa	mple: )-serie	s for	drink	ing w	ater			MCP case narrative
Requested Turn Around Time	4.	NPDES									2111	aı		600	-serie	s for	wast	e wat	er			
10 Business Day (Std)   Rush TAT Requeste 15 Business Day   24 hrs 72 h		RCRA		OKINI SER MORE						SEAT STATE	Rn	t	·	800 Ise con	nmen	ts se	r paz	to fur	wasi ther d	e lefine		
Other 48 hrs 5 Da		Other	IVIO	0,,	,01	21		ИСР					PERMITTE			(	18					
Sample Type Codes  WW-Wastewater DW-Drinking water SW-Surfacewa LW-Labwater GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other	iter			Sis	r Glass(G) MeOH	22	eser 7> Hd			4°C	Nitrogen	Sulfate	Condutivity	Groundwater metals	iter metals	Al/Cr/Fe	PO I MI					
Sample ID	Sampler's Initials	Date Time Collected	Grab	# Containers	Plastic(P) or Glass NaHSO4/MeOH	HNO3 to pH	H2SO4 to pH	HCI to pH	NAOH/ZNAC	None / 4°	Ammonia-Nitroger		Specific C	Groundwater	Surfacewater	Sediment:	Other A S	Other	Other	Other	Other	
MP - 2-1 GW	Dic	11/12/0	3 V	1	6					/					1/4		1					Dissolved metals are field filtered.
MP-2-4 GW	PLC	11/12/0	7/	1	3					1							1			K		Groundwater Metals: Dissolved Al/Cr
GW-47B GW	TRH	11/12/0	7-1	1	0					V						1	/					Surfacewater Metals: Dissolved/Total
GW-425 GW	DLC	11/12/0		3	*	1	1			/	V	1	/	1								Al/Cr/Na
PZ-MRR SW	Die	11/12/0-	1/	4	35	/	1			1	1	1	/		/							PZ-17EF and
DUPLICATE PZITER SW	DIC	11112/0	1	٦	P	1	1			V	/	1			~							are both surface
PZ-16 REW SW	T1=1+	11/12/0	7/	7	P	V	1			/	1	1	1									weser samples
																						The 6010B peremen
		7																				For GW-425 was NOT FILTERED. Plea Use woser from
Sampled by (print):  Dould Chopmo	cr/	Tem 1	ichl	ón	nature	0	?							/	/_	5	101:243 2 8 -		TO:	~		500 WL NP bottle Cooler? Y / N Samples Iced? Y / N
pourd Chapma	n 11	112/07 14	ne: \ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	1	eived	nn	KL		1	)	4	)	11	Date:	1	_	,	ııme		HO		Temp @ receipt:°C
Relinquished by:	Date	Tir	ne:	Reg	eived	by:	J						E	ate:	_ (	, (		Time				Preservation/pH checked
Method of shipment:				T	est	Aı	ne	ric	a-	W	e:	stf	ie	ld								By: Date:

# The America Laboratories, Inc. Chain of ( Stody Form

Test ALIGNEU

Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

Client: Olin Chemical/M.	ACTEC				Proj	ect#:		, 3	<u></u>	260	201	0/	81	- 1	7	Jo	b#					Quo	te#	. PO#
Address: 51 Eames Street				Pro	ject Mar												THE COLUMN	ded Anal	PERSONAL PROPERTY.	Sent the Chicago	100 / 10 / 22		The state of the s	Comments (Special Instructions)
Wilmington, MA	01887				Wo	rk ID:	PCI	ИΡ			50016	11	200			2 3 7 7 1 1 6 2 5	heck	23/25 (V4) PS						(Special instructions)
Phone:	Fax:				Co	ntact	: Dav	id Cl	napr	nan						1200	nd an or exa	mple:					on.	MCP case narrative
Requested Turn Ar			-	Regulat										rm	at			-serie -serie				er		
10 Business Day (Std) XX				NPDES										-		-   .	800 Ise cor	0-seri					ne	
15 Business DayOther	24 hrs	5 Day		RCRA Other	1865	MCP	GW	1131	16			QA/				2016	30 001		3 300	<del>1</del>	TOTAL C		101	
Sample Type Codes  WW-Wastewater DW-Drinking v LW-Labwater GW-Groundwa	water SW-Surfa	acewat	er				SJi	r Glass(G)	2	rese Ç	rvat	ive			370 T	Condutivity	Groundwater metals	iter metals	Al/Cr/Fe			TO DESCRIPTION OF THE PERSON O		
Sample ID		Sample Type	Sampler's Initials	Tir	nte ne ected	Grab	# Containers	Plastic(P) or Glass(G) NaHSO4/MeOH	HNO3 to pH	H2SO4 to	HCI to pH <2	NAOH/ZNAC	None / 4°			Specific C	Groundwa	Surfacewater	Sediment: Al/Cr/Fe	Other	Other	Other	Other	5
1500-1		SW	DLC	11/1	2107	×	4	P	V	V			1	1	1	1	1	1						Dissolved metals are field filtered.
PZ - 18R		Sw	Die	11 H.		×	4	P	1	V			V	V	V	1	1	1						Groundwater Metals: Dissolved Al/Cr
50-17		sur	FRE	ic	2/07	×	4	P	V	V			1	V	1	1	1	1						Surfacewater Metals: Dissolved/Total
1500-3		5W	DUS/FI	H 15		×	4	P	1	1			/	1	~	1	1	1						Al/Cr/Na
1SC0 - Z		sw	DC/TI	-1-1	2/07	×	ц	P	V	-			/	1	V	1	1	~						PZ-1ER a surface
GW-34 SR		GW	TRH	09)		X	3	0	1	1			1	V	/	/	V		1	1				Cplease hore
GN 200 0		1	TRU	# 13 111	17 10	X	3	9	V	/			/	/	1	V	1							scriple 71 me/do
64 242 0 0	up.		Tell	1				f	1	1			1	1	/	/	1							Collected or locate
Gil 200 13 m	•		red															15)r 200						PZ-18R
Gul Just n m	(d	V	TRIL	V		V	V	V_	V	1			V	V	V	V	Ŋ							
Sampled by (print):		,					Sigi	nature	:	- Atte														Cooler? Y / N Samples Iced? Y / N
Relinquished by:	- Perr	/ ¬	Date:	167	Time	45	/	eive	וח	ry		1/0	ک	2		t ( <sub>0</sub>	ate:	6	7	Ti	me:	54	S	Temp @ receipt:°C
Method of shipment:						Va. o	T	est	A	me	erio	ca-	W	es	stf	iel	ld							By:Date:
The second second	X 18 5 15	-10-11	3 70 30	Strik VO	E 13.31	400		y El m	28/7		117	7 1	Wile.		90.0	43		15			dit e	11:		

# restamerica Laboratories, Inc.

Chain of C stody Form



•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 • 143 Nangenay Road I. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

Client: Olin Chemical/M	ACTEC			F	roject #	#: 6	30	8	60	c 19	,				J	ob#	r.H				Quo	ote#		PO#
Address: 51 Earnes Street			E COLLEGE	Project N				37150				0.5	c	n	2000	4000	aded			No Luce	120.00			Comments
Wilmington, MA	STOCK IN THE STOCK				Work IE							1			c	Check	Ana analy	ACCURAGE SHARE						(Special Instructions)
Phone:	Fax:			S I DO NOT SEE	Contac	- 08-0	11/2012	apn	nan						F1970	and ar		s in c	omn	ents	secti	ion.		MCP case narrative
Requested Turn Ar		1000	To the	Regulatory C						al Re	noge	t Fo	rma	at			)-serie							
10 Business Day (Std) XX		nuested		NPDES										1100			)-serie )0-seri						100	
15 Business Day	24 hrs			RCRA -	- MCI	P GW	I/S1 -			MWR	A Sr	nart	Rpt		_ \	Jse co						fine.	11	
Other	48 hrs	5 Day		Other						MCP	QAI	QC F	tpt .	XX	1								a j	
Sample Type Codes  WW-Wastewater DW-Drinking  LW-Labwater GW-Groundw	water SW-Surfa	acewat	er			SIS	r Glass(G) MeOH	<2	3	rvati		၁့	Nitrogen	Sulfate	Condutivity	Nitrate, Nitrite Groundwater metals	ater metals	Al/Cr/Fe						
Sample II	)	Sample Type	Sampler's Initials	Date Time Collected	Grab	Comp. # Containers	Plastic(P) or Glass(NaHSO4/MeOH	HNO3 to pH	H2SO4 to pH	HCI to pH <2	NAOH/ZNAC	None / 4º (	Ammonia-Nitroger	Chloride, Sulfate	Specific C	Groundwater r	Surfacewater	Sediment: Al/Cr/Fe	Othor	Other	Other	Other	Other	
GW-105		GW	DU	11/13/0		3	F	/	1			1	1	/	1	1								Dissolved metals are field filtered.
6w-26		Gu	DLC	11/13/0		3	P	1	/			/	1	/	/	1	The state of							Groundwater Metals: Dissolved Al/Cr
Gw. 2025		Gu	DIE	11/13/07	1	3	P	1	/			/	/	/	1	-	1							Surfacewater Metals: Dissolved/Total
GW- 34D		GW	DLC	11/13/0	1	3	7	1	1			1	1	/	1	-								Al/Cr/Na
																						a	Y.	
										i ci		2.07		18										
																							9	
Sampled by (print):		,				Sig	nature																	Cooler ? Y / N Samples Iced? Y / N
Relinquished by:	Luc.		Date	Henley	me:	Red	eived	by:		1		1	A		C	Date:			T	ime:			(F)	
ميرينس بالمراجعة			11/1	13/17/	340	5 \	1	017	11	X	1	· .	11		11	11-	10	7		1	3 (	1	S	Temp @ receipt:°C
Relinquished by:			Date	3101 T	me:	Red	eived	бу:	1			-			• [	Date:	10		T	ime:				Preservation/pH checked
Method of shipment:					THE STATE OF	T	est	Ai	me	ric	ca-	W	'es	stf	ie	ld								By: Date:
		ALL ROYAL	- L-SVIV	THE RESIDENCE OF			J. Orton			251445	ACTION !		HERE	56351116	9.30		100	==					100	STATE OF THE PARTY

# TestAmerica Laboratories, Inc.

Chain of ( stody Form



Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 1.-9 Rangeway Road J. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

Client: Olin Chemical/MAC	TEC	IS SE			Project	#:	6-	30	cc	60	c I	C				Jo	b#					Qı	uote	#	PO#
Address: 51 Eames Street	State of the state	120112	ENUTY !	- Proiect	Manage		1000	Carl Miles	12	Salting	0.00					888	MEN AND MA	A PARTY NAMED IN	DATE	Ca to Section 1	or o	-	ALC: NO.	е	Comments
Wilmington, MA 01	887	(A.L.)			Work I		MALE OF	2500 500								C	heck		DATE:		equ speci			d	(Special Instructions)
	ax:	NE SE	11 11 11 11 11 11 11 11 11 11 11 11 11		Conta	Arteria.	3550/60	Alle St. Lin	oma	an .				n.		VIII. 100 100 100 100 100 100 100 100 100 10	nd an	C 27.75.76 a		com	ment	sec	ction.		MCP case narrative
Requested Turn Arou	1.40 /07 /07			Regulatory	Classif	icatio	n	1	Spe	ecia				ma	t		500	-serie	es for		ing w			1	
	ush TAT Requ			NPDES							EP F		CHILL TO THE PARTY OF THE PARTY	-	7:14	-   ,,		0-ser	ries fo	r haz	/solid	wast			
	4 hrs 8 hrs 8	72 nrs 5 Day		Other	IVIC	JF GV	1113				CP C					140 000	,							ar <sup>ld</sup>	
Sample Type Codes  WW-Wastewater DW-Drinking wate  _W-Labwater GW-Groundwater  S-Solid / Soil SL-Sludge O-O	A-Air	ewate	er Santana			S	Glass(G)	201	2 5	7	vativ		C	Cultato	onliale.	€   *	ter metals	ter metals	AI/Cr/Fe						
Sample ID	oleme o	Туре	Sampler's Initials	Date Time Collecte	p. Grab	Comp. # Containers	Plastic(P) or Glass(	NaHSO4/MeOH	HNO3 to pH <2	HZSO4 to pH	NaOH to pH >12	NAOH/ZN/	None / 4°C	Allouide o	Cilionide,	Specific Cond	Groundwater metals	Surfacewater	Sediment: AI/Cr/Fe	Other	Other	Other	Other		
GW 31	6		-01	11 15 0	7 1	(4)	P		×	V			X )	1	V	k k	y								Dissolved metals are field filtered.
6W-39 dop		71	TRIL	11 13 4	Х	3	8		X.	X			X Z	(	(	X	y					I R			Groundwater Metals: Dissolved Al/Cr
614-55		-10/	11	4 35	ţ	3	P	100	X.	K			x )	,	(	X	X								Surfacewater Metals: Dissolved/Total
Gw. 765		-u	DUC	11/13/	~ ×	3	P		1	1			4	-	/	1	1					06			Al/Cr/Na
GW - 555	-	su	DLC	11/13/	C7 ×	7	F		~	1			V	1	1	~	1								
Caw - 24	5	J	TRIL	11 14 0	X	3	P		×	X			y	y .	X	×	X								
PZ 18 R		in	TRU	1/4/0	X	3	P		X .	×			X !	Y.	X	×	1				7. 2.				
PZ-16RR	G	500	Duc	11/14/	•	3	P		× >	<			×	× >		×	×								
PZ - 17 PR	c	bu	Duc	10:3	o ×	3	P	16	× ,				×	c ,	<	×	×								
€5- Z015	G	ju	DLC	11/14/	X	3			*	*			~	× '	×	*	×	1							
Sampled by (print):	1 62 10	. 1	h.en.	l els	1	Sig	gnat	ure:				H Meth				= 2	<								Cooler? Y / N Samples Iced? Y / N
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Relinquished by:	- actions	-v	Date:		135 C Time:	Re	peiv	red by	1.0	X	-	01	A		-/	4	ate:	07	7	AUI:	Time	-	35	4	Temp @ receipt:°C
Mathed of objects to									V			1 (4)		112						451					Preservation/pH checked
Method of shipment:	i walit	al Z				7	es	stA	\m	iei	ric	a-	VV	es	tt	iei	d								By:Date:
					- 11 11 -		11,411			SHIP	91/5	- 10		JE S											

# Severn Trent Laboratories, Inc. Chain of stody Form



43131

 53 Southampton Road Westfield, MA 01085
 (P) 413-572-4000
 (F) 413-572-3707 9 Rangeway Road illerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

STL Westfield

(P) 978-667-1400 (F) 978-667-7871 STL Billerica / Service Center

Client: Own,	- In-	C-10-70-	1/~	Proj	ect #	t: (	03	0	<b>C</b> 6	cc	: 10	>			•	Job#		No.				Quote	#	PO#
Address: 51 Ear	nes St			Project Mar	nage		Pe	***	er.				PS	cr			An	alys	is F	₹eq	ues	ted		Comments (Special Instructions)
Phone: Requested Turnaround Time STANDARD × I	Fax: (PLEASE SPEC	IFY)		Regulatory Class NPDES RCRA	ntac ssifi Drir	t: cation	Do on Wat	ں ۔ _er_	ل  s	pec _ Q - D	ial F A/Q0 QE (	C Rep MCP	rt Fy	rma -><	it	500-5 600-5 6000 8000	cample series series -serie -serie	e: for dri for wa s for g s for g	nking iste w round	water, lwater lwate	n NPD r, soi r, soi	i, wasi i, wasi	le le	Please print legibility. If the analytical requests are not clearly defined on the chain-of-custody, the turnaround time will begin after all questions have been
Sample Type Codes NW-Wastewater DW-Drinking W-Lab water GW-Ground		rface w		Other			388(G)	1	Pres	serv	ativ		624.18260 L	8021	8270	Siciole	TPH	7 200.7	PRINCE NO.	stry		define C 1		MCP case narvative
Sample II	)	Sample Type	Sampler's Initials	Time Collected	Grab	Comp. # Containers	Plastic(P) or Gla	NaHSO4/MeOH	HNO3 to pH <2	HCI to pH <2	NaOH to pH >	Na2S203	Volatiles 524	Volatiles 694	Semivoa-525-/625-	PCB / Pest / He	DRO / GRO	(0)	Mercury 245.	General Chemistry	Bacteriological	l oxicity Oil & Grease / TOC		
GW-795		GW	DIC	17/14/07	×	10 4572	P		××			>	( *		WASSELD.	X								Diss. mercls our Field Filtered
																								are piss. Aller
			ACCEPTANCE OF THE PROPERTY OF																					Surface water mer ove DISS/TOTAL
														2:										
Sampled by (print): りこいし	Chopm	- (C	1 +4	~was 14	c- 01	Sig	natu	re:	CO*	_	نبست								L CONTRACTOR					Cooler ? Y / N MADEP Requirement Samples Iced? Y / N
Relinquished by:	ravid Ch	, e b r	Date:	Time: ハノ・サント Time:	× 59	Re	celve	0	DAS	7		) al	2	ly		Oate Oate	67	7	/	Time		59		Temp @ receipt: °C  Preservation / pH checked? Y / N
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# Chain of C stody Form



•53 Southarnpton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 •149 Rangeway Road I. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

Client: Olin Chemical/MA	CTEC			Pro	ect#:	: 6	30	cc	60	cia					Job#	12.4					ote	MOUNT.	PO#
Address: 51 Earnes Street				Project Mai	nager	P	out may war					دِد	٠				alys	is R	equ	este	ed		Comments (Special Instructions)
Wilmington, MA C	Fax:			Co	ork ID: ontact	: Dav	id Ch						1197		and For e	ck ana analy example	tes in e:	comi	nents	sec			MCP case narrative
15 Business Day	ound Time Rush TAT Req 24 hrs 48 hrs			Regulatory Cla NPDES RCRA Other	Drink	king W	ater_		D	EP F	orm Sm	s) art F	 lpt .		8	500-se 600-se 8000-s comme	ries fo eries f	r wast or haz	e wate /solid (	r waste			
Sample Type Codes  WW-Wastewater DW-Drinking wastewater GW-Groundwates S-Solid / Soil SL-Sludge O	er A-Air					LS.	JeOH Jeon		eserv 당 문	3/(1970)	53.00	Cifronen	Sulfate	ondutivity	rite	ter metals	AI/Cr/Fe		*				
Sample ID		Sample Type	Sampler's Initials	Date Time Collected	Grab	# Containers	Plastic(P) or Glass(NaHSO4/MeOH	HNO3 to pH <2	H2SO4 to pH <2	NaOH to pH >12	NAOH/ZN/	None / 4° C	Chloride, S	Specific Condutivity	Nitrate, Nitrite	Groundwater metals Surfacewater metals	Sediment: AI/Cr/Fe	Other	Other	Other	Other		
GW - 785		su	Duc	11/14/57	×	3	T	×	*			<×	×	×	,	~							Dissolved metals are field filtered.  Groundwater Metals: Dissolved
au GAI		-40	て口い	11/15/15	×	3	7	~	*			× ×	*	× >		~						355	Al/Cr
cw 355		GU	T 12-14	15 30	×	3	7	٨	×			- ,	- >			>							Surfacewater Metals: Dissolved/Total Al/Cr/Na
														-									
											×												
Sampled by (print):	. ,	_				1	ature:																Cooler ? Y / N Samples Iced? Y / N
Relinquished by:		) -	Date:	II/) Time	1 1 -	Rec	eived	PN	M	C		21	R	_/	Date Date	5/(	57		Fime:		IL.	Hill	Temp @ receipt;°C
Method of shipment:							<b>'</b>		nei	ric	a-	Ne	esi	tfie	ela	<b>.</b>							Preservation/pH checked  By: Date:

# TestAmerica Laboratories, Inc.

Chain of ( stody Form



Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 STL-WESTFIELD Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871 STL-BILLERICA

Client: Olin Chemical/MACTEC		N. Park	Proj	ect #	#:	6	30	C	c (	U	V	٥(				1000	Job#							Quol	400		PO#
Address: 51 Eames Street			Project Mar	age	r:	γ,		- e		7 1	~-	S.	p.	50	v^		S	****	led nal	4719074		-	ALC: N	Total Co.			Comments
Wilmington, MA 01887		11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Wo	rk ID	): <u>Pl</u>	ant	В		#744.00 11.00		1				)/in		Che	ck a	naly	sis a	and	spec	ify n	neth	od		(Special Instructions)
Phone: Fax:			- Co	ntac	t: Da	avi	d Ch	apr	nan								and For e			inc	com	men	ls se	ectio	n.		MCP case narrative
Requested Turn Around Time			Regulatory Class	sifi	catio	on	1	S	pec	ial				rm	at	20			series series								
10 Business Day (Std) _XX_   Rush TAT Re							ter_								1-9.4		1	3000	-serie	s for	haz	/solid	was	2535			
15 Business Day 24 hrs Other 48 hrs			RCRA ———— Other ———	MC	PGV	V1/	51 -				OP C					0000	Use	COM	nem	5 500	uon	to in	uiei	cem	ie.		
Sample Type Codes WW-Wastewater DW-Drinking water SW-Sur LW-Labwater GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Othe	rfacewat				<sub>2</sub>	Glass(G)	нон	<2	rese	erv	ativ	e	0					0									
Sample ID	Sample Type	Sampler's Initials	Date Time Collected	Grab	Comp. # Containers	Plastic(P) or Glass(G)	NaHSO4/MeOH	HNO3 to pH	H2SO4 to	HCI to pH	NaOH to pH >12	12	None / 4°	8260	VPH	8270	Ammonia	Iron by 6010	Ha	Other	Other	Other	Other	Other	Other	Other	
GW-16	cu	PLE	11)15]67	×	12	V		1	1				3	х	х	х	х	х	х								8260 Compounds Only: 2,4,4 Trimethyl-1-pentene
cw-16 DUT	Cou	DLC	1115157	~	1	1		1	1	,			1	f	1	1	,	,	,						0		2,4,4 Trimethyl-2-pentene
CW-16M5	cu	nuc	11/15/07	1																						6	8270 Comounds Only: NDPA
CU IEMSD	S.L	Due	1116/00		1																						BEHP
IW -10	دى	Duc	11/15/07														1			1000						T)	
Gw-101	5.4	TE	11/15/57					1												8							
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					DISK!																						
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Method of shipment:					7	Гe	st	A	me	er	ic	a-	W	'es	sti	fie	la								Ĭ		By:Date:

#### Severn Trent Laboratories, Inc. Chain of stody Form



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•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

... Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

STL Westfield

STL Billerica / Service Center

19 Rangeway Road

Client:	0110	hemical	ma	CTRC	Pro	ject	#:	63	3–6	×4	.cc	<i>عا</i> د	۶/ ۶	٠ ال	17			Job#						Quo	te#			PO#	and the second	
Address: _	Marie and the second second	ngen, M	10 mm		_ Project Ma		er:	-	COLORAGO	Section 1	risk Great		3 200	37000	51100			Sh Chec	Ar	aly	sis	Red	que	sted meth	d			nments Instruction	ns)	
Phone:		Fax:			Co Regulatory Cla								Rei			rmat		and a For ex 500-s	camp	e;				section	on.	0.334	Please print legibility requests are not clea	CAN TAXABLE CONTRACTOR		
STANDAR		RUSH (Lab Approva		uired)	NPDES RCRA Other							QA/		epo P) F	rt . Rpt		-1	600-s 6000- 8000- Use co	serie serie	s for s for	grour grour	ndwat ndwat	er, so er, so	oil, wa oil, wa	aste		chain-of-custody, th will begin after all qu satisfactorily answer	e turnaround	d time	
ample Type VW-Wastew W-Lab wate -Solid / Soi	rater DW-Drin er GW-Gro	iking water SW-Su undwater A-Air ge O-Oil Z-Oth		water	Date			ss(G)	Н	7	2	rvat	ive		324 /8260	/602 /8021	/625 /8270	Herbicide	Н ЕТРН	/ 200.7	17470-71	istry			100	her				
	Sample	ID := ****	Sample Type	Sampler's Initials	Time Collected	Grab	Comp.	Plastic(P) or Glass	NaHSO4/MeOH	HNO3 to pH <2	H2SO4 to pH <	HCI to pH <2	NaCH to ph >	None / 4° C	Volatiles 524 /6	201	Semivoa 525 //	PCB / Pest / Herbicide	DRO / GRO	Metals 6010 / 2	Mercury 245.1	General Chemistry	Bacteriological	Toxicity	Oil & Grease /	Radchem / Ot				
I	1 = 634		GW	TRH	11 15 37	X	1	P		774.0				K													4500 PH			Milans
50	- SD1		2	DUC	0945				5															dis	100					
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20	102-	MS	5	DIC							- south	esta es	17.																	
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Relinquishe Relinquishe	d by: Ten Ha	nkn	, ,	Date:		100	)	/	ved I	050		4		2	مک	)	11	Date:	6/	17		Tim	10	10	0	Alexanda	Temp @ receipt:			°C
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## Severn Trent Laboratories, Inc. Chain of Custody Form

SEVERN STL

43241

\$53 Southampton Road
 Westfield, MA 01085
 (P) 413-572-4000
 (F) 413-572-3707

◆149 Rangeway Road N. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

Westfield STL Billerica /

Client: Olin				Pr	oject#	:									Job#		59	_	1	uote		PO#.
Address:				Project M	0.00	_									Sh	Anal	_				se	Comments
				V	Vork ID	:_f	5	m	P	_			ų.			k analy	sis an	d spe	city r	netho		(Special Instructions)
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# TestAmerica Laboratories, inc. Chain of Cistody Form



Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707 STL-WESTFIELD N. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871 STL-BILLERICA

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### **APPENDIX C**

# Fourth Quarter 2007 Temporary Cap Inspection Photo Log

Photos 1 through 3: Typical Patching

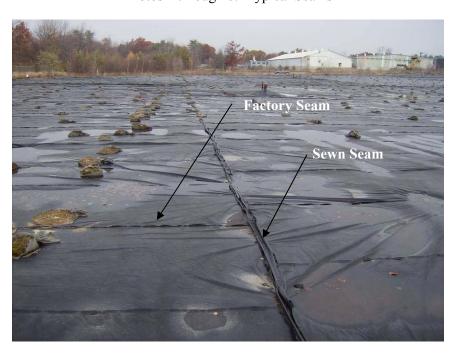


1





Photos 4 through 6: Typical Seams





5



### **APPENDIX B**

## **Data Validation Memorandum**

**Third Quarter 2007 Sampling Event** 



Engineering and Consulting, Inc.

511 Congress Street P.O. Box 7050 Portland, Maine 04112-7050 Telephone: 207/775-5401

Fax: 207/772-4762 Home Page: www.mactec.com

To: Steve Morrow From: Chris Ricardi Date: 12/5/07

Subject: Interim Response Steps Work Plan Slurry Wall/Cap Monitoring Program, and former

Post Construction Monitoring Program Surface Water and Ground Water - August 2007

### Data Validation Summary TestAmerica Laboratories Data Sets 360-11838, 360-11840, and 360-11865

These sample sets contained results for ground water and surface water samples collected during August 2007. The samples were analyzed by TestAmerica (formerly Severn Trent Laboratories) in Westfield, Massachusetts for the following constituents:

**Data Set 11838** Samples GW-79S, GW-202S, GW-25, PZ16RR, PZ17RR, PZ18R, and GW202S DUP (360-11838-1 thru -7):

 Dissolved metals (aluminum, chromium) and general chemistry analysis for ammonia, chloride, sulfate, and specific conductance.

**Data Set 11840** Samples ISCO-3, ISCO-2, PZ-16 RSW, SD-17, ISCO-1, ISCO-1 DUP, and PZ-17RR (360-11840-1 thru -8):

• Total and dissolved metals (aluminum, chromium, and sodium) and general chemistry analysis for ammonia, nitrate, nitrite, chloride, sulfate, and specific conductance.

### **Data Set 11865** Sample PZ18R (360-11865-1)

• Total and dissolved metals (aluminum, chromium, and sodium) and general chemistry analysis for ammonia, nitrate, nitrite, chloride, sulfate, and specific conductance.

The Olin Wilmington Quality Assurance Project Plan 1999 (QAPP) was used as a reference during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington annual and quarterly groundwater monitoring tasks.

With the exception of the items below, results are interpreted to be usable as reported by the laboratory.

#### **Validation Actions and Observations**

The dissolved sodium concentrations in samples PZ18R (360-11865-1), ISCO-3 (360-11840-1), ISCO-1 (360-11840-6), ISCO-1 DUP (360-11840-7), PZ-16 RSW (360-11840-3), and SD-17

(360-11840-4) are greater than the total sodium concentrations. The results for total and dissolved sodium in these samples were qualified estimated (J).

Senior Chemist: Chris Ricardi, NRCC-EAC

Senior Principal Scientist: Michael Murphy

Date: 12/5/07

Date: 12/17/07





### ANALYTICAL REPORT

Job Number: 360-11838-1

Job Description: PCMP 6300060010

For:
Olin Corporation
1186 Lower River Road
Charleston, TN 37310-0248

Attention: Mr. Steven Morrow

Designee for

Becky C Mason

graph a. cliams.

Project Manager II

becky.mason@testamericainc.com 09/04/2007

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 253903-A, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.



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Qc Association Summary	27
Qc Reports	30
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Client Chain of Custody	40

	MADE	MCP Ana	alytical Me	thod Repo	rt Certifica	tion Fo	orm	
Laboratory	Name:	TestAmeric	a Westfield	1 2	Proj	ect#:	360-11	838-1
Project Loc	cation:				MADEP I	RTN¹:		
	provides certific	ations for the fo	llowing data se	t:[list Laboratory	Sample ID Nur	nber(s)]	#32 x	
Sample Ma	atrices:	Groundwater	Soil/Se	ediment	Drinking Wate	r Oth	er:	
MCP SW	846	8260B( )	8151A ( )	8330 ( )	6010B(x)	7470A/1A		Other ( )
Methods	Used	8270C( )	8081A ( )	VPH()	6020 ( )	9014M <sup>2</sup> /	AND THE PERSON OF THE PERSON O	
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1	All Negative res	sponses must b	e addressed in	an attached En	vironmental Lab	oratory ca	se narrati	ve.
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anaryticai	report is, to th	\	\	bener, accura	o and complete			
	Signature:	Dam		~ a	<b>-</b> 5	2 12	ory Direc	tor
CAM VII A, Rev 3	Printed Name:	Steven C. Ha	artmann		_ Date	9 4	40	April-04
TestA	merica	MADEP MA014 NY DOH 10843 RI DOH 57 CT DPH 0494 VT DECWSD	NELAP FL E87912 TOX NELAP NJ MA008 TOX NELAP NY 10843 NH DES 253901-A		TestAmerica Westfield 53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707	1	Boston Service 148 Rangewa N.Billerica, M. Tel:(978)667- Fax:(978)667-	y Rd A 01862 1400

	MADEF	MCP Ana	alytical Me	thod Repo			and the state of t		7 -
_aboratory Name	e:	TestAmeric	a Westfield			ect#:	360-1	1838-1	
Project Location:					MADEP	RTN <sup>1</sup> :	1885		
This form provid	es certifica	ations for the fo	llowing data se	t:[list Laboratory	Sample ID Nur	mber(s)]			
360-11838-(1-7)									
Sample Matrices	s:	Groundwater		ediment	Drinking Water	office and	her:		
MCP SW-846	<b>14</b> 5.	8260B( )	8151A()	8330 ( )	6010B ( )	7470A/1/		Other (	x )
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A	response	to questions l	E and F below	is required for	"Presumptive	Certainty	" status		
and the same of th	\$1000000000000000000000000000000000000	erformance sta ods achieved?	ndards and rec	ommendations t	for the		Yes	(A)	
	e results fo		t compounds/e	lements for the	specified		Yes		No
<sup>1</sup> All Ne	egative res	ponses must b	e addressed in	an attached En	vironmental Lat	oratory c	ase narr	ative.	
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Sign	nature:	Some		- a-	Position	: <u>Labora</u>	tory Dir	ector	
	ed Name:	Steven C. Ha	artmann		_ Date	: <u>9</u>  4	107	April-04	
CAM VII A, Rev 3.2		nitration and the same				ind .	Boston Co.		
TestAme	erica Ental Testino	MADEP MA014 NY DOH 10843 RI DOH 57 CT DPH 0494 VT DECWSD	NELAP NJ MA008 TOX NELAP NJ 10843 NH DES 253901-A		TestAmerica Westfiel 53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707	d	148 Range N.Billerica Tel:(978)6 Fax:(978)	eway Rd a, MA 01862 667-1400	

#### CASE NARRATIVE

Client: Olin Corporation

Project: PCMP 6300060010

Report Number: 360-11838-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 08/22/2007; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.0°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2°C of the required temperature or method specified range. For samples with a specified temperature of 4°C, samples with a temperature ranging from just above freezing temperature of water to 6°C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

#### **DISSOLVED METALS**

Samples 360-11838-1 through 360-11838-7 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 08/23/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

#### **AMMONIA**

Samples 360-11838-1 through 360-11838-7 were analyzed for ammonia in accordance with LACHAT 10-107-06-1. The samples were prepared on 08/28/2007 and analyzed on 08/30/2007.

All QC performance standards and recommendations for this specific method were achieved with the exception of:

Ammonia failed the MS/MSD recovery criteria high for the matrix spike and the matrix spike duplicate of sample 360-11838-2. Refer to the QC report for details. The sample concentration overwhelmed the amount of spike added.

Samples 360-11838-1 through 360-11838-5(10X), 360-11838-6(2X) and 360-11838-7(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high concentration.

#### ANIONS

Samples 360-11838-1 through 360-11838-7 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 08/23/2007 and 08/25/2007.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-11838-1 through 360-11838-5(10X) and 360-11838-7(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high concentration.

#### SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Samples 360-11838-1 through 360-11838-7 were analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 08/23/2007 and 08/29/2007.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

#### METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-11838-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Dissolved Metals	TAL WFD	SW846 6010B	
Sample Filtration performed in the Field	TAL WFD		FIELD_FLTRD
Lachat Ammonia-Nitrogen	TAL WFD	QuickChem 10	)-107-06-1
Distillation/Ammonia	TAL WFD		Distill/Ammonia
Chloride & Sulfate	TAL WFD	40CFR136A 3	00.0
Conductivity, Specific Conductance	TAL WFD	SM18 SM 251	0В

#### Lab References:

TAL WFD = TestAmerica Westfield

#### Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

QuickChem = Lachat Instruments

SM18 = "Standard Methods For The Examination Of Water And Wastewater", 18th Edition, 1992.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-11838-1

Method	Analyst	Analyst ID
SW846 6010B	Nasiatka, Ellen M	EMN
QuickChem 10-107-06-1	Lalashius, Andrew L	ALL
40CFR136A 300.0	Lalashius, Andrew L	ALL
SM18 SM 2510B	Emerich, Rich W	RWE

## SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-11838-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received
360-11838-1	GW-79S	Ground Water	08/21/2007 1045	08/22/2007 1630
360-11838-2	GW-202S	<b>Ground Water</b>	08/21/2007 1230	08/22/2007 1630
360-11838-2MS	GW-202S MS	Ground Water	08/21/2007 1230	08/22/2007 1630
360-11838-2MSD	GW-202S MSD	Ground Water	08/21/2007 1230	08/22/2007 1630
360-11838-3	GW-28 5	Ground Water	08/21/2007 1500	08/22/2007 1630
360-11838-4	PZ16RR	Ground Water	08/21/2007 1100	08/22/2007 1630
360-11838-5	PZ17RR	Ground Water	08/21/2007 1225	08/22/2007 1630
360-11838-6	PZ18R	Ground Water	08/21/2007 1420	08/22/2007 1630
360-11838-7	GW202S DUP	<b>Ground Water</b>	08/21/2007 1230	08/22/2007 1630

# SAMPLE RESULTS

Mr. Steven Morrow

Job Number: 360-11838-1

Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: GW-79S Lab Sample ID: 360-11838-1 Date Sampled: 08/21/2007 1045
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed:	08/23/2007 1157	
Aluminum	ND	ug/L	6.0	100	1.0
Chromium	6.1	ug/L	0.68	5.0	1.0

Job Number: 360-11838-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: GW-79S Lab Sample ID: 360-11838-1 Date Sampled: 08/21/2007 1045
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1551	
Prep Method: Distill/Ammonia		Date Pres	pared:	08/28/2007 1145	
Ammonia	68	mg/L	1.0	1.0	10
Method: 300.0		Date Ana	lyzed:	08/25/2007 0016	
Sulfate	260	mg/L	20	20	10
Chloride	110	mg/L	10	10	10
Method: SM 2510B		Date Ana	lyzed:	08/29/2007 1441	
Specific Conductance	1200	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248 Job Number: 360-11838-1

Client Sample ID: GW-202S Lab Sample ID: 360-11838-2 Date Sampled: 08/21/2007 1230
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifie	er U	nit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08/2	23/2007 1147	
Aluminum	ND	ug	/L	6.0	100	1.0
Chromium	4.5 J	J ug	/L	0.68	5.0	1.0

Mr. Steven Morrow

Olin Corporation

Job Number: 360-11838-1

1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: GW-202S Lab Sample ID: 360-11838-2 Date Sampled: 08/21/2007 1230
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1552	
Prep Method: Distill/Ammonia		Date Prep	pared:	08/28/2007 1145	
Ammonia	100	mg/L	1.0	1.0	10
Method: 300.0		Date Analyzed:		08/25/2007 0047	
Sulfate	670	mg/L	20	20	10
Chloride	91	mg/L	10	10	10
Method: SM 2510B		Date Analyzed:		08/23/2007 0931	
Specific Conductance	1900	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: GW-25 5 Lab Sample ID: 360-11838-3

Date Sampled: 08/21/2007 1500
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Job Number: 360-11838-1

Analyte	Result/Q	ualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08/2	3/2007 1200	
Aluminum	8.9	J	ug/L	6.0	100	1.0
Chromium	15		ug/L	0.68	5.0	1.0

Job Number: 360-11838-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: GW-25 5 Lab Sample ID: 360-11838-3

Date Sampled: 08/21/2007 1500
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1555	
Prep Method: Distill/Ammonia		Date Pres		08/28/2007 1145	
Ammonia	81	mg/L	1.0	1.0	10
Method: 300.0		Date Ana	lyzed:	08/25/2007 0333	
Sulfate	490	mg/L	20	20	10
Chloride	260	mg/L	10	10	10
Method: SM 2510B		Date Ana	lyzed:	08/29/2007 1442	
Specific Conductance	2000	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248 Job Number: 360-11838-1

Client Sample ID: PZ16RR Lab Sample ID: 360-11838-4 Date Sampled: 08/21/2007 1100
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed: 08/23	3/2007 1207	
Aluminum	ND	ug/L	6.0	100	1.0
Chromium	5.0	ug/L	0.68	5.0	1.0

Job Number: 360-11838-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: PZ16RR Lab Sample ID: 360-11838-4 Date Sampled: 08/21/2007 1100
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1556	
Prep Method: Distill/Ammonia		Date Prep	pared:	08/28/2007 1145	
Ammonia	160	mg/L	1.0	1.0	10
Method: 300.0		Date Ana	lyzed:	08/25/2007 0217	
Sulfate	440	mg/L	20	20	10
Chloride	190	mg/L	10	10	10
Method: SM 2510B		Date Analyzed: 08/23/2		08/23/2007 0947	
Specific Conductance	2400	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248 Job Number: 360-11838-1

Client Sample ID: PZ17RR Lab Sample ID: 360-11838-5 Date Sampled: 08/21/2007 1225 Date Received: 08/22/2007 1630

Client Matrix: Ground Water

Analyte	Result/Qua	lifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08/2	3/2007 1209	
Aluminum	ND		ug/L	6.0	100	1.0
Chromium	2.4	J	ug/L	0.68	5.0	1.0

Job Number: 360-11838-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: PZ17RR Lab Sample ID: 360-11838-5 Date Sampled: 08/21/2007 1225
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1557	
Prep Method: Distill/Ammonia		Date Pre	pared:	08/28/2007 1145	
Ammonia	57	mg/L	1.0	1.0	10
Method: 300.0		Date Ana	lyzed:	08/23/2007 1742	
Chloride	27	mg/L	1.0	1.0	1.0
Method: 300.0		Date Ana	lyzed:	08/25/2007 0247	
Sulfate	430	mg/L	20	20	10
Method: SM 2510B		Date Ana	lyzed:	08/23/2007 0954	
Specific Conductance	1400	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248 Job Number: 360-11838-1

Client Sample ID: PZ18R

Lab Sample ID: 360-11838-6

Date Sampled: 08/21/2007 1420 Date Received: 08/22/2007 1630

Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B		Date A	nalyzed: 08/2	3/2007 1212	
Aluminum	ND	ug/L	6.0	100	1.0
Chromium	13	ug/L	0.68	5.0	1.0

Job Number: 360-11838-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: PZ18R Lab Sample ID: 360-11838-6 Date Sampled: 08/21/2007 1420
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1558	
Prep Method: Distill/Ammonia		Date Pres	pared:	08/28/2007 1145	
Ammonia	21	mg/L	0.20	0.20	2.0
Method: 300.0		Date Ana	lyzed:	08/23/2007 2114	
Sulfate	57	mg/L	2.0	2.0	1.0
Chloride	47	mg/L	1.0	1.0	1.0
Method: SM 2510B		Date Ana	lyzed:	08/29/2007 1444	
Specific Conductance	470	umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248 Job Number: 360-11838-1

Client Sample ID: GW202S DUP Lab Sample ID: 360-11838-7

Date Sampled: 08/21/2007 1230 Date Received: 08/22/2007 1630 **Ground Water** 

Client Matrix:

RL Dilution Result/Qualifier Unit MDL Analyte Date Analyzed: 08/23/2007 1214 Method: Dissolved-6010B 100 1.0 6.0 ND ug/L Aluminum 5.0 1.0 4.5 J ug/L 0.68 Chromium

Job Number: 360-11838-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: GW202S DUP Lab Sample ID: 360-11838-7 Date Sampled: 08/21/2007 1230 Date Received: 08/22/2007 1630 Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1558	
Prep Method: Distill/Ammonia		Date Pres	pared:	08/28/2007 1145	
Ammonia	94	mg/L	1.0	1.0	10
Method: 300.0		Date Ana	lyzed:	08/25/2007 0303	
Sulfate	650	mg/L	20	20	10
Chloride	90	mg/L	10	10	10
Method: SM 2510B		Date Ana	lyzed:	08/23/2007 1002	
Specific Conductance	1900	umhos/cm	1.0	1.0	1.0

# **DATA REPORTING QUALIFIERS**

Client: Olin Corporation

Job Number: 360-11838-1

Lab Section	Qualifier	Description
Metals		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
General Chemistry		
	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.

# **QUALITY CONTROL RESULTS**

Client: Olin Corporation

Job Number: 360-11838-1

### **QC Association Summary**

Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
		277.700		
489				
Lab Control Spike	T	Water	6010B	
Lab Control Spike Duplicate	T	Water	6010B	
Method Blank	T	Water	6010B	
GW-79S	D	Water	6010B	
GW-202\$	D	Water	6010B	
Matrix Spike	D	Water	6010B	
Matrix Spike Duplicate	D	Water	6010B	
GW-2S	D	Water	6010B	
PZ16RR	D	Water	6010B	
PZ17RR	D	Water	6010B	
PZ18R	D	Water	6010B	
GW202S DUP	D	Water	6010B	
	Lab Control Spike Lab Control Spike Lab Control Spike Duplicate Method Blank GW-79S GW-202S Matrix Spike Matrix Spike Duplicate GW-2S PZ16RR PZ17RR PZ18R	Client Sample ID   Basis	Client Sample ID         Basis         Client Matrix           489         Lab Control Spike         T         Water           Lab Control Spike Duplicate         T         Water           Method Blank         T         Water           GW-79S         D         Water           GW-202S         D         Water           Matrix Spike         D         Water           Matrix Spike Duplicate         D         Water           GW-2S         D         Water           PZ16RR         D         Water           PZ17RR         D         Water           PZ18R         D         Water	Client Sample ID   Basis   Client Matrix   Method

Report Basis

D = Dissolved

T = Total

Client: Olin Corporation

Job Number: 360-11838-1

# **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry	The Control of the Co	,			
Analysis Batch:360-2	2497		1		1/2
LCS 360-22497/5	Lab Control Spike	Т	Water	SM 2510B	
MB 360-22497/7	Method Blank	Т	Water	SM 2510B	
360-11838-2	GW-202S	Т	Water	SM 2510B	
360-11838-2DU	Duplicate	Т	Water	SM 2510B	
360-11838-4	PZ16RR	T	Water	SM 2510B	
360-11838-5	PZ17RR	Ť	Water	SM 2510B	
360-11838-7	GW202S DUP	Ť	Water	SM 2510B	
Analysis Batch:360-2	22524				
LCS 360-22524/2	Lab Control Spike	Т	Water	300.0	
MB 360-22524/1	Method Blank	т	Water	300.0	
360-11838-5	PZ17RR	Т	Water	300.0	
Analysis Batch:360-2	22525				
CS 360-22525/2	Lab Control Spike	T	Water	300.0	
MB 360-22525/1	Method Blank	Т	Water	300.0	
360-11838-6	PZ18R	т	Water	300.0	
Analysis Batch:360-2					
CS 360-22591/2	Lab Control Spike	Τ	Water	300.0	
MB 360-22591/1	Method Blank	Т	Water	300.0	
360-11838-1	GW-79S	Т	Water	300.0	
360-11838-2	GW-202S	Т	Water	300.0	
360-11838-2MS	Matrix Spike	Т	Water	300.0	
360-11838-2MSD	Matrix Spike Duplicate	Т	Water	300.0	
360-11838-3	GW-2S	T	Water	300.0	
360-11838-4	PZ16RR	T	Water	300.0	
360-11838-5	PZ17RR	T	Water	300.0	
360-11838-7	GW202S DUP	T	Water	300.0	
Prep Batch: 360-2262	25				
LCS 360-22625/2-A	Lab Control Spike	Т	Water	Distill/Ammonia	
MB 360-22625/1-A	Method Blank	T	Water	Distill/Ammonia	
360-11838-1	GW-79S	Ť	Water	Distill/Ammonia	
360-11838-2	GW-202S	T	Water	Distill/Ammonia	
360-11838-2MS	Matrix Spike	T	Water	Distill/Ammonia	
360-11838-2MSD	Matrix Spike Duplicate	T	Water	Distill/Ammonia	
360-11838-3	GW-2S	T	Water	Distill/Ammonia	
360-11838-4	PZ16RR	T	Water	Distill/Ammonia	
360-11838-5	PZ17RR	T	Water	Distill/Ammonia	
360-11838-6	PZ18R	T	Water	Distill/Ammonia	
360-11838-7	GW202S DUP	Ť	Water	Distill/Ammonia	

Client: Olin Corporation

Job Number: 360-11838-1

# **QC Association Summary**

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-2	2694	(-H-0mm (H-1)) - A	( to a succession and the control of the	olarianiania al-	
CS 360-22694/1	Lab Control Spike	T	Water	SM 2510B	
MB 360-22694/4	Method Blank	Т	Water	SM 2510B	
60-11838-1	GW-79S	Т	Water	SM 2510B	
60-11838-3	GW-2S	Т	Water	SM 2510B	
360-11838-6	PZ18R	Т	Water	SM 2510B	
860-11838-6DU	Duplicate	T	Water	SM 2510B	
Analysis Batch:360-2	2828				
CS 360-22625/2-A	Lab Control Spike	т	Water	10-107-06-1	360-22625
MB 360-22625/1-A	Method Blank	Т	Water	10-107-06-1	360-22625
860-11838-1	GW-79S	Υ	Water	10-107-06-1	360-22625
860-11838-2	GW-202S	Т	Water	10-107-06-1	360-22625
860-11838-2MS	Matrix Spike	T	Water	10-107-06-1	360-22625
860-11838-2MSD	Matrix Spike Duplicate	T	Water	10-107-06-1	360-22625
360-11838-3	GW-2S	Т	Water	10-107-06-1	360-22625
360-11838-4	PZ16RR	Т	Water	10-107-06-1	360-22625
860-11838-5	PZ17RR	T	Water	10-107-06-1	360-22625
360-11838-6	PZ18R	T	Water	10-107-06-1	360-22625
360-11838-7	GW202S DUP	T	Water	10-107-06-1	360-22625

Report Basis T = Total

Client: Olin Corporation

Job Number: 360-11838-1

Method Blank - Batch: 360-22489

Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-22489/14

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/23/2007 0929

Date Prepared: N/A

Analysis Batch: 360-22489

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A Initial Weight/Volume:

Final Weight/Volume: mL

Analyte	Result	Qual ME	L RL
Aluminum	ND	6.0	100
Chromium	ND ,	0.6	8 5.0

Lab Control Spike/

Lab Control Spike Duplicate Recovery Report - Batch: 360-22489

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-22489/13

Client Matrix:

Water 1.0

Dilution:

08/23/2007 0927 Date Analyzed:

Date Prepared:

N/A

Analysis Batch: 360-22489

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian 720 ES ICP Lab File ID: N/A

Initial Weight/Volume:

Final Weight/Volume:

10 mL

LCSD Lab Sample ID: LCSD 360-22489/25

Client Matrix:

Water

Dilution: Date Analyzed: 1.0

08/23/2007 1202

Date Prepared:

N/A

Analysis Batch: 360-22489

Prep Batch: N/A

Units: ug/L

Instrument ID:

Varian 720 ES ICP

N/A Lab File ID:

Initial Weight/Volume:

Final Weight/Volume: 10 mL

% Rec. RPD RPD Limit LCS Qual LCSD Qual LCS LCSD Limit Analyte Aluminum 99 97 80 - 120 2 20 2 20 99 97 80 - 120 Chromium

Client: Olin Corporation

Job Number: 360-11838-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22489

Method: 6010B Preparation: N/A

MS Lab Sample ID:

360-11838-2

Analysis Batch: 360-22489

Client Matrix:

Water

Prep Batch: N/A

Instrument ID: Varian 720 ES ICP

1.0

Lab File ID:

N/A

Dilution: Date Analyzed:

Initial Weight/Volume:

Date Prepared:

08/23/2007 1150 N/A

Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-11838-2

Analysis Batch: 360-22489

Instrument ID: Varian 720 ES ICP

Client Matrix:

Water

Lab File ID: N/A

Dilution:

1.0

Prep Batch: N/A

Initial Weight/Volume:

Date Analyzed: 08/23/2007 1152 Date Prepared:

N/A

Final Weight/Volume: 10 mL

	% 1	Rec.				
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual MSD Qual
Aluminum	106	100	75 - 125	5	20	
Chromium	102	97	75 - 125	5	20	
		./		/		

Client: Olin Corporation

Job Number: 360-11838-1

Method Blank - Batch: 360-22625

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-22625/1-A

Client Matrix:

Water

Dilution: 1.0

Date Analyzed: 08/30/2007 1504 Date Prepared: 08/28/2007 1145 Analysis Batch: 360-22828 Prep Batch: 360-22625

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

Analyte

Result

Qual

RL

RL

Ammonia

ND

0.10

0.10

Lab Control Spike - Batch: 360-22625

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-22625/2-A

Client Matrix:

Water 1.0

Dilution:

Date Analyzed: 08/30/2007 1505 Date Prepared: 08/28/2007 1145 Analysis Batch: 360-22828

Prep Batch: 360-22625

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: 50 mL

Analyte

Spike Amount

Result

% Rec.

Limit

Qual

Ammonia

10.0

9.46

95 /

85 - 115

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22625

08/30/2007 1553

08/28/2007 1145

Method: 10-107-06-1

Preparation: Distill/Ammonia

MS Lab Sample ID:

360-11838-2

Water

10

Analysis Batch: 360-22828

Prep Batch: 360-22625

Analysis Batch: 360-22828

Instrument ID:

No Equipment Assigned

Lab File ID:

N/A

Initial Weight/Volume: mL

Final Weight/Volume: 50 mL

Date Prepared:

Date Analyzed:

Client Matrix:

Dilution:

MSD Lab Sample ID: 360-11838-2

Client Matrix:

Water

Dilution:

Date Analyzed:

08/30/2007 1554

Prep Batch: 360-22625

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Date Prepared:

08/28/2007 1145

Final Weight/Volume: 50 mL

Analyte

MS MSD Limit

**RPD Limit** 

MS Qual MSD Qual

Ammonia

75 - 125 160 18

160

RPD

20 4

Calculations are performed before rounding to avoid round-off errors in calculated results.

**TestAmerica Westfield** 

Page 32 of 40

Client: Olin Corporation

Job Number: 360-11838-1

Method Blank - Batch: 360-22524

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22524/1

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/23/2007 1255

Date Prepared: N/A

Analysis Batch: 360-22524

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: mL

Analyte	Result	Qual	RL	RL	
Sulfate	 ND /		2.0	2.0	e v 100
Chloride	ND V		1.0	1.0	

Lab Control Spike - Batch: 360-22524

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22524/2

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 08/23/2007 1310

Date Prepared: N/A

Analysis Batch: 360-22524

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	79.8	100	85 - 115	
Chloride	40.0	40.5	101	85 - 115	

Client: Olin Corporation

Job Number: 360-11838-1

Method Blank - Batch: 360-22525

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22525/1

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/23/2007 1928

Date Prepared: N/A

Analysis Batch: 360-22525

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte	Result	Qual	RL	RL	
Sulfate	ND	***	2.0	2.0	· ************************************
Chloride	ND		1.0	1.0	

Lab Control Spike - Batch: 360-22525

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22525/2

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 08/23/2007 1943

Date Prepared: N/A

Analysis Batch: 360-22525

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	80.4	100	85 - 115	
Chloride	40.0	40.9	102	85 - 115	
Chloride	40.0	40.9	102	03 - 113	

Client: Olin Corporation

Job Number: 360-11838-1

Method Blank - Batch: 360-22591

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22591/1

Client Matrix: Water Dilution:

1.0 Date Analyzed: 08/24/2007 2231

Date Prepared: N/A

Analysis Batch: 360-22591

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: mL

Analyte		Result	Qual	RL	RL	
Sulfate	- Committee of the second seco	ND	10 + 00 3, 13, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,	2.0	2.0	
Chloride		ND ND		1.0	1.0	

Lab Control Spike - Batch: 360-22591

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22591/2

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/24/2007 2246

Date Prepared: N/A

Analysis Batch: 360-22591

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	80.6	101	85 - 115	and we'l the fundamental and so we'de
Chloride	40.0	41.3	103	85 - 115	

Client: Olin Corporation

Job Number: 360-11838-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22591

Method: 300.0 Preparation: N/A

MS Lab Sample ID:

360-11838-2

Analysis Batch: 360-22591

Client Matrix:

Water

Instrument ID: No Equipment Assigned

Lab File ID:

N/A

Dilution:

20

N/A

Initial Weight/Volume:

mL

Date Analyzed: Date Prepared: 08/25/2007 0117

Final Weight/Volume: 10 mL

MS Qual MSD Qual

MSD Lab Sample ID: 360-11838-2

Analysis Batch: 360-22591

Prep Batch: N/A

Instrument ID: No Equipment Assigned

Client Matrix:

Water

Prep Batch: N/A

Lab File ID: N/A

Dilution: Date Analyzed:

Analyte

Sulfate

Chloride

08/25/2007 0202

Initial Weight/Volume: mL Final Weight/Volume: 10 mL

Date Prepared:

N/A

**RPD Limit** MS MSD Limit RPD 100 75 - 125 2 20 94 106 107 75 - 125 1 20

Client: Olin Corporation

Job Number: 360-11838-1

Method Blank - Batch: 360-22497

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-22497/7

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/23/2007 0849

Date Prepared: N/A

Analysis Batch: 360-22497

Prep Batch: N/A Units: umhos/cm Instrument ID: MAN-TECH Ion Plus

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte	Result	Qual	RL	RL	
Specific Conductance	ND /		1.0	1.0	**********

Lab Control Spike - Batch: 360-22497

Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-22497/5

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/23/2007 0837

Date Prepared: N/A

Analysis Batch: 360-22497

Prep Batch: N/A Units: umhos/cm Instrument ID: MAN-TECH Ion Plus

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1430	101	85 - 115	mayoranya santarettaria

Duplicate - Batch: 360-22497

Method: SM 2510B Preparation: N/A

Lab Sample ID: 360-11838-2

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 08/23/2007 0938

Date Prepared: N/A

Analysis Batch: 360-22497

Prep Batch: N/A

Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus Autoti

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	1900	1890	0	20	

Client: Olin Corporation

Job Number: 360-11838-1

Method Blank - Batch: 360-22694

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-22694/4

Client Matrix: Dilution: 1.0

Water

Date Analyzed: 08/29/2007 1125

Date Prepared: N/A

Analysis Batch: 360-22694

Prep Batch: N/A

Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Qual RL RL Result Analyte 1.0 1.0 Specific Conductance ND

Lab Control Spike - Batch: 360-22694

Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-22694/1

Client Matrix: Dilution:

Water 1.0

Date Analyzed: 08/29/2007 1103

Date Prepared: N/A

Analysis Batch: 360-22694

Prep Batch: N/A

Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Qual Limit Analyte Spike Amount Result % Rec. 1410 1430 85 - 115 101 Specific Conductance

Duplicate - Batch: 360-22694

Method: SM 2510B Preparation: N/A

Lab Sample ID: 360-11838-6

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 08/29/2007 1445

Date Prepared: N/A

Analysis Batch: 360-22694

Prep Batch: N/A

Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus Autoti

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

RPD Limit Qual Analyte Sample Result/Qual Result 466 20 Specific Conductance 470

# LOGIN SAMPLE RECEIPT CHECK LIST

Client: Olin Corporation

Job Number: 360-11838-1

Login Number: 11838

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	NA	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	2.0 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	NA	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

# Severn Trent Laboratories, Inc. **Chain of Custody Form**



•53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

STL Westfield

•149 Rangeway Road N. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

STL Billerica / Service Center

Client: MACTEC	Project #:	6300060010 PCM	1P 360 11838 Que	
Address: 107 Sudubon Rd.		Peter Thompson	Shaded areas for office to Analysia Requested	- Comments
WAKEFIELD, MA	Work ID:	THE RESERVENCE OF THE PROPERTY	<ul> <li>Check analysis and specify melt</li> </ul>	hod w [Special instructions)
	Contact:	pave chapma	and analytes in comments section	on. Pipaspiprint (egibility. If the analytical
Phone: 781 245 66 06 Fax: Requested Turnaround Time (PLEASE SPECIFY)	Regulatory Classifica			requests are not clearly defined on the
STANDARD RUSH (Lab Approval Required)	NPDES Drinki RCRA MCP Other	ng Water QA/QC Report  GW1/S1 DQE (MCP) Rpt DEP Form(s)	6000-series for progradwater, soil, we 8000-series for progradwater, soil, we Use comments tection to further defin	cfain-pf-custody, the turnaround time aste will begin after all questions have been ne. satisfactority answered.
Sample Type Codes WW-Wastewater DW-Drinking water SW-Surface water LW-Lab water GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other	Date	Preservative OH	601 /602 /8021 525 /625 /8270 •est / Herbicide VPH 3RO / ETPH 60103 200.7 245.1 / 7470-71 Chemistry ogical	TOC TANK TO THE TA
Sample ID Sample Sample ID	Time Collected	# Containers Plastic(P) or Glass(G) NaHSO4/MeOH HNO3 to pH <2 HCI to pH <2 HCI to pH <2 NaOH to pH >12 NaUS2O3 NaUS2O3 None I 4° C Volatiles 524 /824 /8260	Volatiles 601 /602 /8021 Semivoa 525 /825 /8270 PCB / Pest / Herbicide EPH / VPH DRO / GRO / ETPH Metals 6010 / 200.7 Mercury 245.1 / 7470-7 General Chemistry Bacteriological Toxicity	101 & Grease / TOC Radchem / Other EPA 3-20, O Staff P PC 2513 & Sp 147061 & Arrivari As 1
6W-25 795 GW TRH	1042 K	3 P K K K		<u>    X   X   X                         </u>
GW-2025 GW TKH	1230	3P // /		11/1/1/
6 GW-25 GW TEH	8/21/07 K	3 P		
B PZ 16 RR GW DLC	8/2107 X	3 P		
PZ 17 RR GW DLL	\$121107 K	3 P		<del>- - 4 4- </del> 4- -
PZ 18 R GW DLC	8/21/07 K	3 P \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \		<del>-                                     </del>
GW 16 GW DLC	1575 K	3 P		
GW 2025 DUP / TRH	82107 K	3 P		
GW 2025 MS TRH	8 21 07 K	5 P ]		1 (1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
6W 2025 MSD & TRH	1270 K	3 P V V V		VV
Sampled by (print):	e chapma	Signature:	1 0000	Cooler (Y) N Samples Iced (Y) N
Relinquished by: Qal	e: 1/67 //60	Received by:	8/22/07 (43	D Temp@receipt: 2,0°0 °C
Reinquisited by: Size and Size	17 1630	Received by: UMN	Date: Time: 1630	
Relinguished by: Dat	e: Time:	Received by:	Date: Time:	By: <u>WAN</u> Date: 8 22 01

Version 2, April 2003

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date As Galle	"/	sk	57
Sr. Review/Date Chris Ricevel 1	11	27	10
Lab Report # 360 - 1183P-1		,	
Project # 6300060011.61.1			

emmonia sulfate, chloride specific conductonce.

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0	<u>Laboratory Deliverable Requirements</u>	
ACTI	1.1 Laboratory Information: Was all of the following provided in the laboratory report?  Check items received.  Name of Laboratory  Name  Address  Address  Client Information:  Name  Address  Client Contact  ON: If no, contact lab for submission of missing or illegible information.	
	1.2 Laboratory Report Certification Statement	Yes No No NA Comments:
	Does the laboratory report include a completed Analytical Report Certification in the	required format?
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct	format.
	1.3 Laboratory Case Narrative:  Narrative serves as an exception report for the project and method QA/QC performance.	
		Certification Statement.
ACTIC	N: If no, contact lab for submission of missing or illegible information.	
	1.4 Chain of Custody (COC) copy present with all documentation completed?	Yes No No N/A Comments:
	Does the laboratory report include copies of Chain of Custody forms containing all samples i	in this SDG?
	NOTE: Olin receives and maintains the original COC.	
ACTIO	N: If no, contact lab for submission of copy of missing completed COC.	

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

	Yes 🗾	No []	N/A []	Comments:	
☐ Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered ☐ Container type noted ☐ Condition observed ☐ pH verified (where applicable) ☐ Field and lab			ion, temperate	ure requirement de	oes not apply).
ACTION: If no, contact lab for submission of missing or incomplete documentation.  1.5.1 Were the correct bottles and preservatives used?  Ammonia,— 1 Liter polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C  Oil & Grease — 1 Liter glass/HCL to pH<2,cool to 4°C	Yes 🔝	No [_]	N/A [_]	Comments:	a o
Alkalinity – 1 Liter polyethylene/cool to 4°C  Chemical Oxygen Demand – 50 mL polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C  Chloride, pH, sulfate - 50 mL polyethylene/cool to 4°C  Organic Carbon – 500 mL amber glass bottle/HCl or H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C					
Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C  Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C  ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment					
1.5.2 Were all samples delivered to the laboratory without breakage?	Yes [_]	No [_]	N/A [_]	Comments:	# S
1.5.3 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?		No [1]	N/A [_]	Comments:	

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST

### WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

	nple Results Section: Was th ort for each sample?	e following information supplied in the	Yes   No	N/A [_] Comments:	÷
Field ID and I	Lab ID Date and time	e collected Analyst Initials  Preparation method	Dilution Factor Date of preparation/extractio	% moisture or solids an/digestion clean-up and analysi	
☐ Matrix	☐ Target analytes a	and concentrations	☑ Units (soils must be reported	l in dry weight)	
ACTION: If no,	contact lab for submission of m	issing or incomplete information.			
1.7 QA/0 for each s	QC Information: Was the follo	owing information provided in the labora	tory report Yes [ No [ ]	N/A [_] Comments:	
Method blank i	results  LCS recoveries	MS/MSD recoveries and RPDs	Laboratory duplicate results (where	applicable)	
ACTION: If no, o	contact lab for submission of mi	ssing or incomplete information.			
1.50					
2.0 Holding	Times		Yes [ No [	N/A] Comments:	
Have any	technical holding times, deter	mined from date of collection to date of	analysis, been exceeded? The hol	ding times are as follows:	
/ 28	days = ammonia, chemical oxy	gen demand, chloride, organic carbon, o	oil & grease, specific conductance,	total organic carbon and sulfat	e
	ralinity = 14 days	Sulfide, TDS, TSS = 7 days	pH = analyze immediately	Nitrate nitrogen as N =	
	rite nitrogen as N = 48 hrs	Nitrate + Nitrite as N = 28 days			
		ne with # of days exceeded on checklist			8
	en de mandre autre per en la composition de la mandra de la composition della compo	led qualify results (J). For water sample	on that are arrasely avanaded (SIV	hold time) reject (D) all non d	stact results Professional
judgment used to q		ieu quanty fesuns (7). For water sample	/		cicci icsuits. Troicssional
3.0 L	aboratory Method		Yes No No	N/A [_] Comments:	
3.1 Was t	he correct laboratory method us	ed?			
ACTION: If no, co	ontact lab to provide justificatio	n for method change compared to the req	uested method. Contact senior chen	nist to inform Client of change o	or to request variance.

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			<del></del>	
	3.2 Are the practical quantitation ☐ SOW ☐ QAPP ☐ L	limits the same as those specifab?	fied by the Yes No No N/A	Comments:
	Note: The MADEP QA/QC Guidelines of therefore all criteria will default to values s define criteria, QA/QC requirements defa may also apply.	tipulated in the QAPP*. Where the QA	APP does not	
	Ammonia* = 0.1 mg/ L	Alkalinity** $\square = 1 \text{ mg/L}$	Bicarbonate Alkalinity** $\square = 1 \text{ mg/L}$	Carbonate Alkalinity** $\square = 1 \text{ mg/L}$
	Nitrate Nitrogen as N* □ = .05 mg/L	Nitrite Nitrogen as N* □ = .01 mg	g/L Chloride* = 1 mg/L	Hardness $*\Box = 2 \text{ mg/L}$
	Spec. Cond.**	Total Organic Carbon** □ = 1 m	$mg/L$ Oil & Grease* $\square = 3 mg/L$	Sulfate (EPA 300.0)* ☐ = 2 mg/L
	COD;* Low – 20 mg/L	COD* High - 50 mg/L □	$TDS* \square = 10 \text{ mg/L}$	TSS* $\square$ = 5 mg/L
	pH* □ < 2 to > 12		9	¥
	Other parameter(list)	PQL =	☐ Source of PQL =	
	Other parameter(list)	PQL =	□ Source of PQL =	V
ACTIO	ON: If no, evaluate change with respect to sa	ample matrix, preparation, dilution, mo	oisture, etc. If sample PQL is indeterminate, contact	et lab for explanation.
	3.3 Are the appropriate parameter results p	present for each sample in the SDG?	Yes No No N/A	Comments:
ACTIO	ON: If no, check Request for Analysis to ver	ify if method was ordered and COC to	o verify that it was sent, and contact lab for resubm	
	3.4 If dilutions were required, were dilution	n factors reported?	Yes No No N/A	Comments:
ACTIO	ON: If no, contact the lab for submission.			
4.0	Method Blanks		Yes No No N/A	Comments:
	4.1 Are the Method Blank Summaries pre-	sent?	ž	ii
ACTIO	ON: If no, call the laboratory for submission	of missing data.		
	4.2 Was a method blank analyzed for eac 20 or less?	h analysis batch of wet chemistry field	d samples of Yes No No N/A	Comments:
			**	

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ACTI	ON: If no	, document discrepancy in case narrative and contact lab for justification. Consult sens	ior chemist f	or action nee	ded.		
	4.3 Is th	he method blank less than the PQL? (See Section 3.2 for PQLs).	Yes 🗾	No [_]	N/A [_]	Comments:	
				,	/		e
		any method blanks have positive results for wet chemistry parameters? Qualify data ing to the following:	Yes [_]	No [_]	N/A []	Comments:	
	If the sa PQL or	ample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the the concentration reported if greater than the PQL.					
	If the sa	ample concentration is $> 5 \times$ blank value, no qualification is needed.					
ACT) qualifi		ny blank has positive results, list all the concentrations detected and flagging level (fla	igging level	= 3 × blank	value) on the	inecklist. List all a	meeted samples and me.
5.0	Labora	atory Control Standards					
	5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes 📝	No [_]	N/A [_]	Comments:	
		o, call laboratory for LCS form submittal. If data is not available, use professional ermine qualification actions for data associated with the batch.					
	5.2	Is a LCS Summary Form present?	Yes [_]	No []	N/A []	Comments:	
ACTI	ON: If no	, contact lab for resubmission of missing data.			**		
	5.3	In account the minter and the LCS measurement with the control limits?	Yes [ ]	No [ ]	N/A [ ]	Comments:	
	5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	100	110 [-]	TWA [_]	Comments.	

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Bicarbonate Alkalinity\*\* □ = 80-120%

Carbonate Alkalinity\*\* □ = 80-120%

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Specific Conductivity \*□ = 80-120%

CS	*			-
		ım	ш	

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Alkalinity\*\* □ = 80-120%

	Total Organic Carbon** □ = 80-120%	TDS** □ = 80-120%	Oil & Grease* □ = 80-120%	Ammonia Nitrogen as N* ☐ = 80-120%
	COD Low* □ = 80-120%	COD High* □ = 80-120%	Nitrate Nitrogen as N**□ = 85-115%	Nitrite Nitrogen as N** □= 75-120%
	Hardness* □ = 85-115%	Chloride* □ = 80-120%	Sulfate (EPA 300.0)* ☑ = 75-125%	$pH* \square = 98-102\%$ TSS* NA
	Other parameter(list)	%R =	☐ Rec Limits=	
	Other parameter(list)	%R =	☐ Rec Limits =	
		(MADEP has not yet defined LCS recover	ery limits for wet chemistry analyses.)	
	ON: If recovery is above the upper limit, the batch as (J). If LCS recovery is <10%		batch as (J). If recovery is below the lower	limit, qualify all positive and no-detect results
			*	
5.0	Matrix Spikes	186 U		E
	했다면 얼마나 하는 아이를 하는 아이들은 아이들에 나가 있다면 살아가지 않는데 아이를 하는데	frequencies based on monthly, quarterly, cents for each set with the senior chemist.	or task	#/ #/
	6.1 Were project-specific MS/MSD	s analyzed? List project samples that were spi	iked.	Comments: Sample GW2025 us/NO andgiis.
ACTIO	ON: If no, contact senior chemist to see if	any were specified.	Yes   No   NA	us/MD artis
	6.2 Is the MS/MSD Recovery For	m present?		
ACTIO	ON: If no, contact lab for resubmission of	missing data.	Yes   No [] N/A [	] Comments:

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST

		WET CHEMISTRY PARAM	ETERS BY VARIOUS METHOD	os	
6.3	Were matrix spikes analyzed a matrix?	t the required frequency of 1 per 20	samples per Yes   No [ ]	N/A [ ] Comment	s:
ACTION: If an	y matrix spike data is missing, cal	lab for resubmission.		Turi	SAY I
6.4		pike recoveries outside of the QC limits	? Yes No L	N/A [_] Comment	s:
	NOTE: $%R = $ $(SA)$	SSR-SR) x 100% SA = Spike added	The amnonia us/nsi eccol linuts. The come four times the spike Carbonate alkalinity*=NA	Where: SSR = prient records	Spiked sample result SR = Sample result rentation is great
MS/MS	SD Recovery Limits:	+1	con four times the spike	concertation. No t	both ackin required
Alkalin	nity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHA	T) = 74-125%
Chlorid	le*(SM 4500 Cl) 🗗 77-116%	Specific Conductivity * = NA	Total Organic Carbon* = NA	$TDS^{**} = NA$	
	Grease* = NA	COD Low* □ = 61-142%			T** □ = 75-119%
Nitrite 1	Nitrogen as N** □ = 68-136%	Hardness* □ = 70-130%	Sulfate (EPA 300.0)* 🖼 = 75-1		
Other p	parameter(list)	% R =	□ Rec	Limits =	2000 - 10
NOTES	S: 1) If only one of the recoveries 2) If the MS/MSD was perform MSD flags only apply to the samp	Olin QAPP Limits (MADEP has not	ontrol limits, no qualification is necessarple, no qualification is required.  ncentration is > 4X spike. If the recessary	essary. Use professional jud	gment for the MS/MSD flags.  exceed the upper control limit,
		overies of the MS and MSD are lower detect, the results are considered unusa		0%, qualify both positive re	sults and non-detects (J). If the
	oratory control limits apply when o flags are applied.	spiked sample results fall within the no			
6.5 Are	any RPDs for MS/MSD recoveries	es outside of the QA/QC limits?	/ 9		5: Ammoni M'D
NOTE:	$= \frac{S - D}{(S + D)/2} \times 100\%$ W	here S = MS result D = MSD result	Yes No No No	N/A Comments	ulida tatom is
			over w	- Samle	ione, is greater
				times spike	cone. No forther
			action	of inel	
WET CHEM.doo	c		Page 6 of 9		

	MS/MSD RPD Limits:						
	Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* =	= NA An	nmonia** (LACHA'	T) □ = 8%	
	Chloride**(SM 4500 Cl) 12 = 15%	Specific Conductivity * = NA	Total Organic Carbon*	* = NA TI	OS** = NA Total O	rganic Carbon* = N	IA.
	COD Low** □ = 14%	COD High** □ = 16%	Nitrate Nitrogen as N*		itrite Nitrogen as N*	* □ = 16%	
	Oil & Grease* = NA	Hardness* = NA	Sulfate (EPA 300.0)* I	= 10% pH	$I^* = NA$	TSS* = NA	
	Other parameter(list)		RPD =	□ RPD	limit =		
	Other parameter(list)		RPD =	□ RPD	) limit =		
	* = Laboratory Limits	** = Olin QAPP Limits					
	(MADEP has not yet defined LCS	recovery limits for wet chemistr	ry analyses.)				
7.0	Laboratory Duplicate			/			
	Are the RPDs for the laboratory dup	olicates <20% unless otherwise spe	ecified below? Yes	No []	N/A [_] Com	ments:	
ACTI	ON: If the RPD is greater than specifie	d limits, qualify all results for that a	analyte as estimated (J).				
	Alkalinity* = 4% Bicarl	bonate Alkalinity* = 4%	Carbonate alkalinity* = 4%	6 O	oil & Grease* □ = 2	0%	
	pH* □ = 3% Speci	fic Conductivity *■ = 5%	TSS** □ = 6%	T	$DS^{**} \square = 6\%$		
		W.					
8.0	Sampling Accuracy						
	najority of ground water samples ar dedicated tubing. Rinse blanks will	엄마는 아이들이 어느 아이들이 아이들이 나는 그렇게 하면 하는 사람이 되었다. 그 사람이 되고 있다면 하다 하는데 없다.	process stream, or				
	8.1 Were rinsate blanks collected? associated samples from the senior cl		, obtain a list of the Yes [	_l No [J	N/A [_] Com	ments:	
	8.2 Do any rinsate blanks have positi	ve results?	Yes [_	_] No [_]	N/A Com	ments:	

ACTI	ON: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below.  If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.
	If the sample concentration is $> 5 \times$ blank value, no qualification is needed.
NOTE	: MADEP does not require the collection of rinsate blanks.
9.0	Field Duplicates
	9.1 Were field duplicate samples collected? Obtain a list of samples and their associated Yes [ No [ N/A [ Comments: Samples field duplicates.]] No [ N/A [ Comments: Samples field duplicates.]
SO	9.2 Were field duplicates collected per the required frequency?  Yes No NA Comments:  W D QAPP D MADEP Option 1(1 per 20) D MADEP Option 3 (1 per 10) D
	9.3 Was the RPD ≤ 50% for soils or waters? Calculate the RPD for all results and Yes No No NA Comments: See attacked attach to this review.
ACTI	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.
	Was any of the data qualified?  Yes No N/A Comments:
	If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages

SAMPLE ID	<b>ANALYTE</b>	ORIG	DUP	RPD
GW-202S	Sulfate	670	650	3
GW-202S	Chloride	91	90	1
GW-202S	Ammonia	100	94	6
GW-202S	Specific Conductance	1900	1900	0

### REFERENCES

LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999.

STL-Westfield, 2002. "Olin - General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

Version 1.2, Nov 2002

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Sr. Review/Date	Way Ercard	11	127	10-
Lab Report #	360-11838-1			

aluminu	in, chromium
1.0 <u>L</u>	Laboratory Deliverable Requirements
0	Address Project ID Phone # Sample identification – Field and Laboratory  Name of Laboratory Name  Name of Laboratory Name  Name
ACTION	N: If no, contact lab for submission of missing or illegible information.
1	1.2 Laboratory Report Certification Statement  Yes [ No [ ] N/A [ ] Comments:
Does the	laboratory report include a completed Analytical Report Certification in the required format?
ACTION:	If no, contact lab for submission of missing certification or certification with correct format.
1	1.3 Laboratory Case Narrative: Yes 1 No 1 N/A 1 Comments:
E o	Narrative serves as an exception report for the project and method QA/QC performance.  Narrative serves as an exception report for the project and method QA/QC performance.  Narrative includes an explanation of each discrepancy on the
	Certification Statement.
ACTION:	If no, contact lab for submission of missing or illegible information.
1	.4 Chain of Custody (COC) copy present with all documentation completed  Yes No No NA Comments:
N	OTE: Olin receives and maintains the original COC.
ACTION:	: If no, contact lab for submission of copy of completed COC.

	1.5 Sample	Recei	pt Information	(Cooler Receipt	Form present?):		Yes 🗾	No [_]	N/A [_]	Comments:	
/	Were each of into the labor			completed and rec	orded upon receipt of th	e sample(s)					
1	- 2	/			les were sent by courier averified (where applicable	/	7			ature requirement do	es not apply).
ACTIO	N: If no, cont	act lab	for submission	of missing or incor	nplete documentation.						
	1.5.1	Wei	re all samples de	livered to the labor	atory without breakage?	ű.	Yes []	No [_]	N/A [_]	Comments:	
	1.5.2	with	sample receipt,	eceipt Form or La condition of the sa ing the quality of the	b Narrative indicate othe mples, analytical problem te data?	er problems as or special	Yes [_]	No 🗾	/ N/A [_]	Comments:	
	1.6 Sample laborator	Resu y repo	Its Section: Want for each sam	as each of the foll ble?	owing requirements supp	olied in the	Yes 🗾	No [_]	N/A [_]	Comments:	
Z Æiel Z Člea 3 Matr	ld ID and Lab n-up method ix	ID	∕□ Analysi	nd time collected s method ytes and concentrat	Preparation i	method		reparation/e	extraction/dige		Reporting limits analysis, where applicable
ACTIO	N: If no, cont	act lab	o for submission	of missing or incor	nplete information.						
			mation: Was reach sample ba		wing information suppli	ied in the	Yes 🗾	No [_]	N/A [_]	Comments:	

# OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST

WAKU	OFERA	MIG.	LKOC.	EDUKE	AIND	CHE
IC	PMETAI	SRV	MET	HOD 60	10R/2	00.7

/		/			A				
☐ Me	thod blan	ik results ZLCS recov	reries MS/MSD reco	veries and RPDs	Laboratory	duplicate re	sults (where	e applicable)	
ACTIO	ON: If n	o, contact lab for submissi	on of missing or incomplet	e information.			×		
2.0	Holdi	ng Times					×	_	
Have a	exceed		mined from date of colle tals is 180 days from samp			Yes []	No Ld	N/A _]	Comments:
NOTE	: List sar	nples that exceed hold tim	e with # of days exceeded	on checklist			*		
ACTIO			e exceeded, qualify all pos olding time) reject (R) all n		d non-detects				
3.0	Labor	ratory Method							
					8				
	3.1	Was the correct labor	ratory method used?			Yes [ ]	No [_]	N/A [_]	Comments:
		Water Digestion	3005A or 3010A or	3020A	3				
*	£	Soil Digestion Metals	3050B 6010B or 200.7						
comp	pared to		tory to provide justific Contact senior chemist				ž	ŧ	
	3.2	Are the practical qua	nntitation limits the sam	e as those spec	ified by the	Yes 🗾	No [_]	N/A [_]	Comments:
NOT	E: Verify	that the reported metals r	natch the target list specific	ed on the COC.					

		If no, evaluate variation with respect to sample matrix, preparation, dilution, c. If sample PQL is indeterminate, contact lab for explanation.			<b>₹</b> 9	
	3.3	Are results present for each sample in the SDG?	Yes 📗	No [_]	N/A [_]	Comments:
ACTIO	ON: If no	o, check Request for Analysis to verify if method was ordered and COC to verify that i	t was sent, a	nd contact la	ıb for resubmi	ssion of the missing data
	3.4	If dilutions were required, were dilution factors reported?	Yes 🔝	No [_]	N/A [_]	Comments:
ACTI(	ON; If no	o, contact the lab for submission.		4		
4.0	Meth	od Blanks				
	4.1	Is the Method Blank Summary present?	Yes 🗾	No []	N/A [_]	Comments:
ACI	TON:	If no, call the laboratory for submission of missing data.		•		
	4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes 📝	No [_]	N/A [_]	Comments:
		If no, contact laboratory for justification. Consult senior chemist for action rate non-compliance.	2)			
	4.3	Is the method blank less than the PQLs for all target elements?	Yes [	No[ ]	N/A [ ]	Comments:
NOT samp		DEP requires the method blank to be matrix matched and digested with the				
	4.4 the follo	Do any method blanks have positive results for metals? Qualify data according to owing:	Yes [_]	No U	N/A [_]	Comments:

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5.0	Labo	oratory Control Standard				
	5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes 🔝	No [_]	N/A []	Comments:
AC'	TION:	target, second source LCS is required by MADEP.  Call laboratory for LCS form submittal. If data are not available, use l judgement to evaluate data accuracy associated with that batch.	*			
	5.2	Is a LCS Summary Form present?	Yes 🗾	No [_]	N/A [_]	Comments:
AC.	TION:	If no, contact lab for resubmission of missing data.				
	5.3	Is the recovery of any analyte outside of MADEP control limits?  MADEP	Yes [_]	No 🗹	N/A [_]	Comments:
7	Samp Water	le Type	10			
	Soil	within Lab generated limits				
with non-	in the b	If recovery is above the upper limit, qualify all positive sample results patch as (J). If recovery is below the lower limit, qualify all positive and results within the batch as (J). If LCS recovery is <30%, positive and non-s are rejected (R).				
						-

6010

Comments:

#### OLIN CORPORATION

#### LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Yes [ No [] N/A [] Comments: Saugle GW 202.

Comments:

Comments:

Yes [ No [ ] N/A [ ] Comments:

Yes No [ ] N/A [ ]

Yes [ No [ N/A [ ]

#### 6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

		MADEP	QAPP	
Sample Type		% Rec	% Rec	Method
Water		75-125	N/A	6010B
Water		N/A	70-130	200.7
Soil	0.	75-125	75-125	6010B

NOTE: 
$$%R = (SSR-SR) \times 100\%$$
  
SA

Where: SSR = Spiked sample result

SR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.				
ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J).				
6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?	Yes [ · ]	No Ly	N/A:	Comments:
NOTE: RPD = S-D x 100% Where: $S = MS$ sample result $D = MSD$ sample result				
NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.				
<b>ACTION:</b> If the RPD exceeds the control limit, qualify positive results and non-detects (J).				
.0 <u>Laboratory Duplicate</u>			1	
7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present?	Yes	No 🗹	N/A [_]	Comments:
NOTE: MADEP refers to this sample as a "matrix duplicate".	<u> 8</u>		-	
ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance.				
7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?	Yes [_]	No [_]	N/A [	Comments:

MADEP Laboratory Duplicate Sample RPD Criteria:	<b>QAPP RPD</b>
For aqueous results > 5x RL, RPD must be ± 20%	20
For aqueous results < 5× RL, RPD must be < RL	20
For soil/sediment results > 5× RL, RPD must be ±35%	20
For soil/sediment results < 5× RL, RPD must be ≤ 2× RL	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

#### 8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- 8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
- 8.2 Do any rinsate blanks have positive results?

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

#### 9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes [ No [ N/A [ Comments: Samples
GW-2025 and GW-2025 DP.

	9.2 Were field duplicates collected per the required frequency?	Yes 📈	No ∐	N/A [_]	Comments:	
so	W □ QAPP (1 per 10) ☑ MADEP Option 1 (1 per 20) □ MADEP Option 3 (1 per 10) □	,	/			
×	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes 🗾	No [_]	N/A [_]	Comments: See	attachel
ACTIO	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results i	f the RPD o	exceeds 50	%.		
10.0	Special QA/QC			/		*
	10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.	Yes [_]	No 🗹	N/A [_]	Comments:	
ACT	TON: If results for both total and dissolved are $\geq 5x$ the PQL and the dissolved			*		

ACTION: If results for both total and dissolved are  $\geq 5x$  the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

10.0	Application of Validation Qualifiers						-
	.*					/	
	Was any of the data qualified?			Vac [ ]	Note	N/A F T	Comments

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

#### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

SAMPLE ID	ANALYTE	ORIG	DUP	RPD
GW-202S	dissolved Aluminum	ND	ND	0
GW-202S	dissolved Chromium	4.5	4.5	0



### **ANALYTICAL REPORT**

Job Number: 360-11865-1

Job Description: Laboratory Analysis

For:
Olin Corporation
1186 Lower River Road
Charleston, TN 37310-0248

Attention: Mr. Steven Morrow

Designee for

Joseph a. Cham. J.

Becky C Mason

Project Manager II

becky.mason@testamericainc.com 09/05/2007

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 253903-A, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.



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MA	DEP MCP An	alytical Me	thod Repo	rt Certifica	tion F	orm	
aboratory Name:	TestAmeric	ca Westfield		Proj	ect #:	360-11	865-1
Project Location:				MADEP F	RTN <sup>1</sup> :		
	ertifications for the f	ollowing data set	t:[list Laboratory	Sample ID Nun	nber(s)]		
Sample Matrices:	Groundwater	Soil/Se	ediment	Drinking Wate	r Oth	ner:	
MCP SW-846	8260B( )	8151A()	8330 ( )	6010B(x)	7470A/1A	10.	Other ( )
Methods Used	8270C( )	8081A()	VPH()	6020 ( )		9012()	
As specified in MAC Compendium of Analytical Methods, check all that apply	1 List Releas 2 M - SW-84	8021B ( ) e Tracking Numl 6 Method 9014 o 6 Methods 7000	r MADEP Physi	ologically Availa	7196A ( ble Cyani nd analyte	ide (PAC)	Method
An affirmative	esponse to question	ons A, B, C and	D is required for	or "Presumptiv	e Certair	nty" statu:	s
A Were all that des	samples received b	y the laboratory i of-Custody docu	n a condition co mentation for the	nsistent with e data set?		Yes	No <sup>1</sup>
B included discuss	QA/QC procedures in this report follower a narrative QC dates or guidelines?	ed, including the	requirement to r	note and	le l	Ŷ	No <sup>1</sup>
C for "Pres	e analytical data inclusion cumptive Certainty", EP document CAM Guidelines for the Ac	as described in S VII A, " Quality A	Section 2.0 (a), ( Assurance and C	b), (c) and (d) o Quality	f	Yes	N/A No
	d EPH methods online modifications (see				out	Yes	NA N
A res	onse to questions	E and F below	is required for	"Presumptive	Certainty	" status	7,1117 - 3,011
E Were al	QC performance st	andards and rec	100 100 100	- 100 A		Ye	No <sup>1</sup>
The state of the s	sults for all analyte-li s) reported?	st compounds/e	lements for the	specified		Yes	N/A(N
<sup>1</sup> All Nega	ive responses must	be addressed in	an attached En	vironmental Lab	oratory ca	ase narrat	ive.
, the undersigned inquiry of those re	attest under the p sponsible for obtai to the best of my	ains and penalt	ies of perjury t	hat, based upo erial contained	n my per in this		
Signatu	re: 55	Stort	na	Position	: Labora	tory Direc	ctor
Printed I	lame: Steven C. H	artmann		Date	<u>9:</u>	5.07	April-04
TestAmeri	MADEP MA014  NY DOH 10843 RI DOH 57  CT DPH 0494 VT DECWSD	NELAP FL E87912 TOX NELAP NJ MA008 TOX NELAP NY 10843 NH DES 253901-A		TestAmerica Westfiel 53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707	d	Boston Service 148 Rangew N.Billerica, M Tel:(978)667 Fax:(978)667	ay Rd MA 01862 -1400

	MADE	MCP Ana	alytical Me	thod Repo	rt Certifica	tion Fo	rm	******
Laboratory		TestAmeric		(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)			360-118	65-1
Project Loc	ration:				MADEP F	RTN <sup>1</sup> :		2010-1-
	provides certific	ations for the fo	ollowing data se	t:[list Laboratory	Sample ID Nun	nber(s)]		
Sample Ma	atrices:	Groundwater	Soil/S	ediment	Drinking Wate	r Othe	r:	
MCP SW	WIND-WIN-	8260B( )	8151A()	8330 ( )	6010B()	7470A/1A (		her(x)
Methods	Used	8270C( )	8081A()	VPH()	6020 ( )	9014M <sup>2</sup> /90	)12()	
As specifie	d in MADEP	8082 ( )	8021B ( )	EPH()	7000 S <sup>3</sup> ( )	7196A ( )	04	
Compendio Analytical I (check all t	Methods.	2 M - SW-846	Method 9014	ber (RTN), if kno or MADEP Physi Series List indiv	ologically Availa		e (PAC) N	1ethod
An affi	rmative respo	nse to questio	ns A, B, C and	D is required f	or "Presumptiv	e Certainty	y" status	
Α	Were all samp	les received by	the laboratory	in a condition co	nsistent with		(Yes)	No
В	included in this	s report follower arrative QC data	d, including the	specified analyti requirement to r eet appropriate	note and		Ŷ	No <sup>1</sup>
С	for "Presumpti the MADEP do	ve Certainty", a	is described in : /II A, " Quality /	ort meet all the re Section 2.0 (a), ( Assurance and C eporting of Analy	b), (c) and (d) o Quality	f	Yes C	ÑA No
- D				or EPH Method f respective Meti		nout	Yes (	NA No
	A response	to questions	E and F below	is required for	"Presumptive	Certainty"	status	
E	Were all QC p		andards and rec	commendations t				No <sup>1</sup>
F	Were results f		st compounds/e	elements for the	specified		Yes <	N/A No
1	All Negative re	sponses must b	e addressed in	an attached En	vironmental Lab	oratory cas	e narrativ	e.
I, the und	ersigned, attes	st under the pa	ains and penal	ties of perjury t nation, the mate	hat, based upo erial contained	n my perso in this		
analytical	report is, to tr	Le Dest Of Hily I	\ \alpha	d belief, accurat	o and complet			
	Signature:		Art -		Position	: <u>Laborato</u>	ry Direct	or
CAM VII A, Rev 3		Steven C. Ha	artmann	n m2	_ Date	: 9,5	07	April-04
Test <sub>A</sub>	merica	MADEP MA014 NY DOH 10843 RI DOH 57 CT DPH 0494 VT DECWSD	NELAP FL E87912 TO NELAP NJ MAGOS TO: NELAP NY 10843 NH DES 253901-A		TestAmerica Westflet 53 Southampton Rd, Westfleld, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707		oston Service ( 148 Rangeway N.Billerica, MA Tel:(978)667-1 Fax:(978)667-7	Rd 01862 400

#### CASE NARRATIVE

Client: Olin Corporation

**Project: Laboratory Analysis** 

Report Number: 360-11865-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 08/23/2007; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 4.6°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2°C of the required temperature or method specified range. For samples with a specified temperature of 4°C, samples with a temperature ranging from just above freezing temperature of water to 6°C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

#### **DISSOLVED METALS**

Sample 360-11865-1 was analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 08/24/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

#### **TOTAL METALS**

Sample 360-11865-1 was analyzed for total metals in accordance with EPA SW846 Method 6010B. The samples were prepared and analyzed on 08/24/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

#### **AMMONIA**

Sample 360-11865-1 was analyzed for ammonia in accordance with LACHAT 10-107-06-1. The samples were prepared and analyzed on 08/30/2007.

All QC performance standards and recommendations for this specific method were achieved.

#### **ANIONS**

Sample 360-11865-1 was analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 08/24/2007.

All QC performance standards and recommendations for this specific method were achieved.

Sample 360-11865-1(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilution was due to high Chloride concentration.

#### SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Sample 360-11865-1 was analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 08/29/2007.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

#### METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-11865-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Inductively Coupled Plasma - Atomic Emission Spectrometry	TAL WFD	SW846 6010B	
Total Metals	TAL WFD	SW846 6010B	
Sample Filtration	TAL WFD		FILTRATION
Acid Digestion of Aqueous Samples and Extracts for	TAL WFD		SW846 3010A
Lachat Ammonia-Nitrogen	TAL WFD	QuickChem 10-	-107-06-1
Distillation/Ammonia	TAL WFD		Distill/Ammonia
Chloride & Sulfate	TAL WFD	40CFR136A 300.0	
Nitrate & Nitrite	TAL WFD	40CFR136A 30	0.00
Conductivity, Specific Conductance	TAL WFD	SM18 SM 2510	B

#### Lab References:

TAL WFD = TestAmerica Westfield

#### Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

QuickChem = Lachat Instruments

SM18 = "Standard Methods For The Examination Of Water And Wastewater", 18th Edition, 1992.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

# METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-11865-1

Method	Analyst	Analyst ID
SW846 6010B	Wickham, James T	JTW
QuickChem 10-107-06-1	Lalashius, Andrew L	ALL
40CFR136A 300.0	Lalashius, Andrew L	ALL
SM18 SM 2510B	Emerich, Rich W	RWE

## SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-11865-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received	
360-11865-1	PZ18R	Water	08/23/2007 1400	08/23/2007 1745	

# **SAMPLE RESULTS**

Job Number: 360-11865-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: PZ18R Lab Sample ID: 360-11865-1 Date Sampled: 08/23/2007 1400 Date Received: 08/23/2007 1745

Client Matrix: Water

Analyte	Result/Qu	alifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08/2	24/2007 1354	
Aluminum	17	J	ug/L	6.0	100	1.0
Chromium	3.8	J	ug/L	0.68	5.0	1.0
Sodium	77000	.2	ug/L	95	2000	1.0
Method: 6010B		79	Date A	nalyzed: 08/2	24/2007 1738	
Prep Method: 3010A			Date P	repared: 08/2	24/2007 0901	
Aluminum	100		ug/L	6.0	100	1.0
Chromium	12		ug/L	0.68	5.0	1.0
Sodium	61000	3	ug/L	95	2000	1.0

Job Number: 360-11865-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: PZ18R Lab Sample ID: 360-11865-1 Date Sampled: 08/23/2007 1400 Date Received: 08/23/2007 1745

Client Matrix: Water

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1539	
Prep Method: Distill/Ammonia		Date Prep	pared:	08/30/2007 0925	
Ammonia	13	mg/L	0.10	0.10	1.0
Method: 300.0		Date Ana	lyzed:	08/24/2007 1628	
Sulfate	71	mg/L	2.0	2.0	1.0
Nitrate as N	2.2	mg/L	0.050	0.050	1.0
Method: 300.0		Date Ana	lyzed:	08/24/2007 1643	
Nitrite as N	ND	mg/L	0.10	0.10	10
Chloride	150	mg/L	10	10	10
Method: SM 2510B		Date Ana	lyzed:	08/29/2007 1447	
Specific Conductance	760	umhos/cm	1.0	1.0	1.0

## **DATA REPORTING QUALIFIERS**

Client: Olin Corporation

Job Number: 360-11865-1

Lab Section	Qualifier	Description
Metals		
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

# **QUALITY CONTROL RESULTS**

Client: Olin Corporation

Job Number: 360-11865-1

## **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
Metals					
Prep Batch: 360-22510	1 0000000000000000000000000000000000000				7,000,000
LCS 360-22510/2-A	Lab Control Spike	T	Water	3010A	
LCSD 360-22510/3-A	Lab Control Spike Duplicate	T	Water	3010A	
MB 360-22510/1-A	Method Blank	T	Water	3010A	
360-11865-1	PZ18R	T	Water	3010A	
Analysis Batch:360-22	556				
LCS 360-22556/13	Lab Control Spike	T	Water	6010B	
LCSD 360-22556/25	Lab Control Spike Duplicate	T	Water	6010B	
MB 360-22556/14	Method Blank	Т	Water	6010B	
360-11865-1	PZ18R	D	Water	6010B	
Analysis Batch:360-22	2559				10
LCS 360-22510/2-A	Lab Control Spike	Т	Water	6010B	360-22510
LCSD 360-22510/3-A	Lab Control Spike Duplicate	Τ	Water	6010B	360-22510
MB 360-22510/1-A	Method Blank	Т	Water	6010B	360-22510
360-11865-1	PZ18R	T	Water	6010B	360-22510

### Report Basis

D = Dissolved

T = Total

Client: Olin Corporation

Job Number: 360-11865-1

## **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-22					
LCS 360-22569/2	Lab Control Spike	Т	Water	300.0	
MB 360-22569/1	Method Blank	T	Water	300.0	
360-11865-1	PZ18R	Т	Water	300.0	
Analysis Batch:360-22	590				
_CS 360-22590/2	Lab Control Spike	T	Water	300.0	
MB 360-22590/1	Method Blank	Т	Water	300.0	
360-11865-1	PZ18R	T	Water	300.0	
Analysis Batch:360-22	694				
CS 360-22694/1	Lab Control Spike	T	Water	SM 2510B	
MB 360-22694/4	Method Blank	T	Water	SM 2510B	
360-11865-1	PZ18R	Т	Water	SM 2510B	
Prep Batch: 360-22719	)				
CS 360-22719/2-A	Lab Control Spike	T	Water	Distill/Ammonia	
MB 360-22719/1-A	Method Blank	T	Water	Distill/Ammonia	
360-11865-1	PZ18R	Τ	Water	Distill/Ammonia	
Analysis Batch:360-22	2829				
LCS 360-22719/2-A	Lab Control Spike	Т	Water	10-107-06-1	360-22719
MB 360-22719/1-A	Method Blank	T	Water	10-107-06-1	360-22719
360-11865-1	PZ18R	T	Water	10-107-06-1	360-22719

Report Basis
T = Total

Job Number: 360-11865-1 Client: Olin Corporation

Method Blank - Batch: 360-22510

Method: 6010B Preparation: 3010A

Lab Sample ID: MB 360-22510/1-A

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/24/2007 1703 Date Prepared: 08/24/2007 0901 Analysis Batch: 360-22559 Prep Batch: 360-22510

Units: ug/L

Instrument ID: Varian 720 ES ICP

N/A Lab File ID:

Initial Weight/Volume: 50 mL Final Weight/Volume: 50 mL

Analyte			Result	Qual	MDL	RL	
Aluminum	1.1	St. Section	ND		6.0	100	
Chromium			ND /		0.68	5.0	
Sodium			ND /		95	2000	

Lab Control Spike/

Lab Control Spike Duplicate Recovery Report - Batch: 360-22510

Method: 6010B Preparation: 3010A

LCS Lab Sample ID: LCS 360-22510/2-A

Client Matrix:

Water

Dilution:

1.0

Date Analyzed: Date Prepared: 08/24/2007 1705

08/24/2007 0901

Analysis Batch: 360-22559

Units: ug/L

Prep Batch: 360-22510

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A

Initial Weight/Volume:

50 mL

Final Weight/Volume: 50 mL

LCSD Lab Sample ID: LCSD 360-22510/3-A

Client Matrix:

Water

Dilution:

1.0

Date Analyzed:

08/24/2007 1708

Date Prepared:

08/24/2007 0901

Analysis Batch: 360-22559 Prep Batch: 360-22510

Units: ug/L

Varian 720 ES ICP Instrument ID:

Lab File ID: N/A

Initial Weight/Volume: 50 mL

Final Weight/Volume: 50 mL

		9	6 Rec.					
Analyte		LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Aluminum	gregory months of a series make young address a	97	98	80 - 120	1	20		war en AMANAMANAN ET
Chromium		98	99	80 - 120	1	20		
Sodium		94	96	80 - 120	1	20		

Client: Olin Corporation

Job Number: 360-11865-1

Method Blank - Batch: 360-22556

Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-22556/14

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 08/24/2007 1257

Date Prepared: N/A

Analysis Batch: 360-22556

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A Initial Weight/Volume:

Final Weight/Volume: mL

Analyte				Result	Qual	MDL	RL ·	
Aluminum	to an exercise comment of	707. 10.00000000000000000000000000000000	51,0000000 <b>#</b> 0.3	ND /	Y +V	6.0	100	
Chromium				ND /		0.68	5.0	
Sodium				ND /		95	2000	

Lab Control Spike/

Lab Control Spike Duplicate Recovery Report - Batch: 360-22556

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-22556/13

Client Matrix:

Water

Dilution:

1.0

Date Analyzed: 08/24/2007 1254

Date Prepared:

N/A

Analysis Batch: 360-22556

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A Initial Weight/Volume:

Final Weight/Volume:

10 mL

LCSD Lab Sample ID: LCSD 360-22556/25

Client Matrix:

Water

Dilution:

1.0

Date Analyzed:

Date Prepared:

08/24/2007 1342 N/A

Analysis Batch: 360-22556

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: Initial Weight/Volume:

Final Weight/Volume: 10 mL

		% Rec.					
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual	LCSD Qual
Aluminum	100	99	80 - 120	0	20		<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>
Chromium	100	99	80 - 120	1	20		
Sodium	100	98	80 - 120	2	20		

Client: Olin Corporation

Job Number: 360-11865-1

Method Blank - Batch: 360-22719

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-22719/1-A

Water

1.0

Date Prepared: 08/30/2007 0925

Date Analyzed: 08/30/2007 1527

Analysis Batch: 360-22829

Prep Batch: 360-22719

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

Analyte

Dilution:

Ammonia

Client Matrix:

Result

Qual

RL

RL

ND

0.10

0.10

Lab Control Spike - Batch: 360-22719

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-22719/2-A

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 08/30/2007 1528

Date Prepared: 08/30/2007 0925

Analysis Batch: 360-22829

Prep Batch: 360-22719

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID:

N/A

Initial Weight/Volume: mL

Final Weight/Volume: 50 mL

Analyte

Spike Amount

Result

% Rec.

Limit

Qual

Ammonia

9.50 10.0

95

85 - 115

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation

Job Number: 360-11865-1

Method Blank - Batch: 360-22569

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22569/1

Client Matrix: Water

Dilution: 1.0 Date Analyzed: 08/24/2007 1558

Date Prepared: N/A

Analysis Batch: 360-22569

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID:

Initial Weight/Volume: mL

Final Weight/Volume:

Analyte	Result	Qual	RL	. RL	
Nitrate as N	ND /	#P####################################	0.050	0.050	
Nitrite as N	ND /		0.010	0.010	

Lab Control Spike - Batch: 360-22569

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22569/2

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/24/2007 1613

Date Prepared: N/A

Analysis Batch: 360-22569

Prep Batch: N/A Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Nitrate as N	4.00	4.12	103	85 - 115	V - A VW parameter annulations
Nitrite as N	4.00	4.11	103	85 - 115	

Client: Olin Corporation

Job Number: 360-11865-1

Method Blank - Batch: 360-22590

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22590/1

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/24/2007 1558

Date Prepared: N/A

Analysis Batch: 360-22590

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume:

Final Weight/Volume:

Analyte			Result	Qual	RL	RL	
Sulfate	i i i sayawa a	10 Money - server 1 1	ND /	/	2.0	2.0	V-W
Chloride			ND /		1.0	1.0	

Lab Control Spike - Batch: 360-22590

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22590/2

Client Matrix:

Water

Dilution: 1.0

Date Analyzed: 08/24/2007 1613

Date Prepared: N/A

Analysis Batch: 360-22590

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume:

Qual % Rec. Limit Spike Amount Result Analyte 85 - 115 Sulfate 80.0 82.0 102 103 / 85 - 115 Chloride 40.0 41.1

Client: Olin Corporation

Job Number: 360-11865-1

Method Blank - Batch: 360-22694

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-22694/4

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/29/2007 1125

Date Prepared: N/A

Analysis Batch: 360-22694

Prep Batch: N/A

Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

Analyte

Specific Conductance

Result Qual ND

RL 1.0

RL 1.0

Lab Control Spike - Batch: 360-22694

Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-22694/1

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/29/2007 1103

Date Prepared: N/A

Analysis Batch: 360-22694

Prep Batch: N/A

Units: umhos/cm

Instrument ID: MAN-TECH Ion Plus

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

% Rec. Limit Qual Analyte Spike Amount Result 1410 1430 101 85 - 115 Specific Conductance

## LOGIN SAMPLE RECEIPT CHECK LIST

Client: Olin Corporation

Job Number: 360-11865-1

Login Number: 11865

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	NA	* /
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	4.6 C
Cooler Temperature is recorded.	True	
COC is present.	True	ā
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	*
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	False	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	NA	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

# Severn Trent Laboratories, Inc. Chain of Custody Form



39115

\$3 Southampton Road
 Westfield, MA 01085
 (P) 413-572-4000
 (F) 413-572-3707

149 Rangeway Road
 N. Billerica, MA 01862
 (P) 978-667-1400
 (F) 978-667-7871

STL Westfield

STL Billerica / Service Center

Client: MACTEC	Project #:	63000(0010/81.17	ob#360-11865 Quote#	PO#	
Address: 107 Audubon Rd.  Uaketizld MA	Project Manager: Work ID:	Peter Thompson	Shaded areas for office use Analysis Requested Check analysis and specify method	Comments (Special Instructions)	
Phone: 781 245 6406 Fax: Requested Turnaround Time (PLEASE SPECIFY)  STANDARD RUSH	Contact: Regulatory Classification	tation   Special Report Format   Special Report Format   Special Report Format   Special Report   Special Re	and analytes in comments section. For example: 500-series for drinking water 800-series for waste water, NPDES 6000-series for groundwater, soil, waste 8000-series for groundwater, soil, waste	Please print legibility. If the analytical requests are not clearly defined on the chain-of-custody, the turnaround time will begin after all questions have been	
(Lab Approval Required) Sample Type Codes WW-Wastewater DW-Drinking water SW-Surface water LW-Lab water GW-Groundwater A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other	Other	PH (9) H (9)	The comments section to further define.  1 7 200.7   1 7 470-71   1 7	satisfactorily answered.	
Sample ID Sampler's	Time Collected	P) or G 04/Me 04/Me to pH <2 03 1 4° C 1 4° C es 524 es 601	PCB / Pest / Hert EPH / VPH DRO / GRO / E1 Metals 6010 / 20 Mercury 245.1/74 General Chemistry Bacteriological Toxicity Oil & Grease / TC Radchem / Other	2510 Spec Ammunia as	
PZ 18 R SW SPENITSW TR	8 23 07 K	4 P X X X	N N	KKK	
			no	2 x l liter Nitriz accident bottler. I (one ) will	
	8/3/6			be les titered to dissolved metals.	
				Charle, N	
Sampled by (print): Thomas Hanlin	+	Signatures		Cooler ? N MADEP Requirement Samples Iced? N N	
Relinquished by:  Relinquished by:  8/2	ate: Time: 1500 ate: 7 45 ate: Time: Time: Time: 1500 ate: Time: T	Regelived by: J Wall	Date: / Time: /500 Date: / Time: /7 /5 Date: Time: /7 /5	Temp @ receipt: 4,6% °C  Préservation / pH checked? Ø / N	
Relinguished by:	ate. Time.	Received by.	Dutc.	By: WAY Date: 8130	

Version 1.2, Nov 2002

# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/D		211	-	Ulin	A. T	13/0	7	1.7
Sr. Review/	_	Ch	-		nds	11	121	0/
Lab Repor	t#	360	- //	165-1			1	
Project #_	63	0006	001	1.41.		_		

total and dissolved aluminum chromium sodium	
1.0 <u>Laboratory Deliverable Requirements</u>	
1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes No No NA Comments:  Check items received.  Name of Laboratory Address Project ID Phone # Sample identification – Field and Laboratory  Client Information: Name Address Client Contact (IDs must be cross-referenced)	
ACTION: If no, contact lab for submission of missing or illegible information.	
1.2 Laboratory Report Certification Statement  Yes No NA Comments:	
Does the laboratory report include a completed Analytical Report Certification in the required format?	
ACTION: If no, contact lab for submission of missing certification or certification with correct format.	
1.3 Laboratory Case Narrative:  Yes No NA Comments:	
Narrative serves as an exception report for the project and method QA/QC performance.  Narrative includes an explanation of each discrepance on the	псу
Certification Statement.	
ACTION: If no, contact lab for submission of missing or illegible information.	
1.4 Chain of Custody (COC) copy present with all documentation completed  Yes No NA Comments:	
NOTE: Olin receives and maintains the original COC.	
ACTION: If no, contact lab for submission of copy of completed COC.	

1.5 S	Sample R	Receipt Information (Cooler Receipt Form present?):	Yes 🗾	No [_]	N/A [_]	Comments:
	each of te labora	f the following tasks completed and recorded upon receipt of the sample(s) atory?				*
		confirmed: must be 1° - 10° C. (If samples were sent by courier and delivered				ture requirement does not apply).
☐ Container ty	pe noted	d ☑ sample condition observed ☑ pH verified (where applicable) ☑ Field at	nd lab IDs cro	oss reference	ed	
ACTION: If n	io, contac	act lab for submission of missing or incomplete documentation.				
			/	(		
1	1.5.1	Were all samples delivered to the laboratory without breakage?	Yes [	No [_]	N/A [_]	Comments:
	N					**
1		Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes [_]	No 🗸	N/A [_]	Comments:
		circumstances arrecting the quanty of the data:	- ,	/ *		
		Results Section: Was each of the following requirements supplied in the report for each sample?	Yes 🗸	No []	N/A [_]	Comments:
					W:	
☐ AField ID an ☐ Clean-up me ☐ Matrix	nd Lab II ethod	D Date and time collected Analyst Initials Analysis method Preparation method Uni	Dilution	reparation/e	xtraction/diges	noisture or solids Reporting limits stion clean-up and analysis, where applicable
LLI TYTULETE		2 Talgot analytoo and concominations	is (boils indo	. de repertue		,
ACTION: If n	o, contac	ect lab for submission of missing or incomplete information.		/		a a
		Information: Was each of the following information supplied in the ort for each sample batch?	Yes 🗾	No [_]	N/A [_]	Comments:

6010

### OLIN CORPORATION

### LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

/		/	4.0		1				
☐ Me	hod blank res	ults ELCS recove	ries   MS/MSD reco	veries and RPDs	☐ Laboratory	duplicate re	sults (where	e applicable)	
ACTIO	N: If no, con	tact lab for submissio	n of missing or incomple	te information.					
2.0	Holding Ti	imes					(41)		
Have a	THE RESERVE OF THE PARTY OF THE	Holding time for meta	nined from date of colle ls is 180 days from samp			Yes [_]	No L	N/A]	Comments:
NOTE:	List samples	that exceed hold time	with # of days exceeded	on checklist					
ACTIO	N. If tachnic	nal halding times are	exceeded, qualify all pos	itiva sasulta (I) as	ad non detects				
ACIIC		하다 그는 사람은 아이들이 아이들이 아니는 사람들이 되었다.	ding time) reject (R) all r	Contraction of the second seco	ia non-detects				
	(O3). II BIO.	sary exceeded (271 nor	anig milo) reject (xt) an r	ion delect resums.					
-2002		12/20/02/1							
3.0	Laborator	y Method							
					5.6		/		
	3.1 Wa	as the correct labora	tory method used?			Yes L	No [_]	N/A [_]	Comments:
	Wa	ater Digestion	3005A or 3010A or	3020A	<u> </u>				
		il Digestion	3050B	002011					
5		etals	6010B or 200.7						
	1110	, turis	001015 01 200.7						
ACT	TON: If no	o contact laborate	ry to provide justif	ication for met	hod change				
			Contact senior chemis		1000				
	o request var		Sommer Semen Chemis	to morni one.	at or onlinge				
and	o request var	ianoc.					/		
						/			996
		the practical quan	titation limits the sam PP □ Lab □ M		ified by the	Yes 🔼	No [_]	N/A []	Comments:
NOT	E: Verify that t	the reported metals m	atch the target list specifi	ed on the COC.				Ä , S	

6010

		If no, evaluate variation with respect to sample matrix, preparation, dilution, c. If sample PQL is indeterminate, contact lab for explanation.	/	·		
	3.3	Are results present for each sample in the SDG?	Yes 🗾	No [_]	N/A [_]	Comments:
ACTI	ON: If no	o, check Request for Analysis to verify if method was ordered and COC to verify that i				ssion of the missing data
	3.4	If dilutions were required, were dilution factors reported?	Yes 🔝	No [_]	N/A [_]	Comments:
ACTIO	ON: If no	o, contact the lab for submission.		¥.		
				4		
4.0	Metho	od Blanks	,			
	4.1	Is the Method Blank Summary present?	Yes 🔝	No [-]	N/A [_]	Comments:
AC	TION: I	If no, call the laboratory for submission of missing data.				
			/	/		
	4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes [ ]	No [_]	N/A [_]	Comments:
		If no, contact laboratory for justification. Consult senior chemist for action rate non-compliance.				2
	4.3	Is the method blank less than the PQLs for all target elements?	Yes [ 1	No[]	N/A []	Comments:
NOT samp		DEP requires the method blank to be matrix matched and digested with the				
	4.4 I	Do any method blanks have positive results for metals? Qualify data according to owing:	Yes []	No 🔝	N/A [_]	Comments:

If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the	e
PQL or the concentration reported if greater than the PQL.	

If the sample concentration is > 5 × blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5x th	e blank	value) and the associated samples and qualifiers.				
.0	Labor	atory Control Standard				
	5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes 🔝	No [_]	N/A []	Comments:
ACT	ION:	I target, second source LCS is required by MADEP.  Call laboratory for LCS form submittal. If data are not available, use judgement to evaluate data accuracy associated with that batch.		/		
	5.2	Is a LCS Summary Form present?	Yes 🔝	No [_]	N/A [_]	Comments:
ACT	ION: If	no, contact lab for resubmission of missing data.			,	
	5.3	MADER	Yes [_]	No 🗾	N/A [_]	Comments:
0.5	Sample Water Soil	Type % Rec 80-120 within Lab generated limits				
withir non-d	ON: In the basetects re	If recovery is above the upper limit, qualify all positive sample results tch as (J). If recovery is below the lower limit, qualify all positive and esults within the batch as (J). If LCS recovery is <30%, positive and non-are rejected (R).	*			
						**

Comments:

#### OLIN CORPORATION

### LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

### 6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

Yes No N/A Comments

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

Yes No NA Comments

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

Yes No No N/A Comments:

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

				/	
Yes	1	No I	1	N/A[/]	Comments

		MADEP	QAPP		
Sample Type		% Rec	% Rec	Method	
Water		75-125	N/A	6010B	
Water		N/A	70-130	200.7	
Soil	2	75-125	75-125	6010B	

NOTE: 
$$%R = (SSR-SR) \times 100\%$$
  
SA

Where: SSR = Spiked sample result SR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

	OTE: If only one of the recoveries for an MS/MSD pair is outside of the control mits, no qualification is necessary. Use professional judgment for the MS/MSD flags.				
ar re	CTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the ecoveries of the MS and MSD are lower than the lower control limit, qualify positive sults and non-detects (J).				
	6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?	Yes [_]	No [_]	N/A:	Comments:
N	OTE: RPD = S-D x 100% Where: $S = MS$ sample result $D = MSD$ sample result				
	OTE: If dilutions are required due to high sample concentrations, the data are raluated, but no flags are applied.				
<b>A</b> (J)	CTION: If the RPD exceeds the control limit, qualify positive results and non-detects).				
7.0	Laboratory Duplicate			/	8
	7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Duplicate Sample Form present?	Yes 🔲	No 🗾	N/A [_]	Comments:
N	OTE: MADEP refers to this sample as a "matrix duplicate".				
	CTION: If not analyzed, qualification is not needed. If data is missing, contact poratory for resubmission of report. Narrate non-compliance.				
	7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?	Yes [_]	No [_]	N/A	Comments:
	and the second s				

6010

	MADEP Laboratory Duplicate Sample RPD Criteria:	OAPP RPD				
	For aqueous results > 5x RL, RPD must be ± 20%	20				
	For aqueous results < 5× RL, RPD must be ≤ RL	20				
	For soil/sediment results > 5× RL, RPD must be ±35%	20				
2	For soil/sediment results $< 5 \times RL$ , RPD must be $\leq 2 \times RL$					
	TON: If the RPD exceeds the limits, qualify both positive timated and flag them J. Narrate non-compliance	re results and non-detects				
0.0	Counting Assurage					i g
8.0	Sampling Accuracy	i	Ä		7.2	
ů.						
	njority of ground water samples are collected directly from	a tap, process stream, or				
with de	edicated tubing. Rinse blanks will not be collected.				1	
	8.1 Were rinsate blanks collected? Prior to evaluating rin	nsate blanks, obtain a list of	W f 1	Not V	N/A [ ]	Comments:
	the associated samples from the senior chemist.		Yes [_]	NOLY	N/A	Comments.
	8.2 Do any rinsate blanks have positive results?		Yes []	No [_]	N/A	Comments:
NOT	E: MADEP does not require the collection of rinsate blanks	S.				
ACT	ION: Evaluate rinsate results against blank results to	determine if contaminant				
	be laboratory-derived. If results are not lab-related, qualif					
		A service of the serv				
	If the sample concentration is < 5 × blank value, flag sample re-	sult non-detect "U" at the				
	PQL or the concentration reported if greater than the PQL.					
		50.000.000.00150.01				
	If the sample concentration is $> 5 \times$ blank value, no qualification	on is needed.				
	V = 8					
9.0	Field Duplicates				/	
	9.1 Were field duplicate samples collected? Obtain a list of	samples and their associated			27/4 5 2	<i>a</i> .
	field duplicates.	<u> </u>	Yes	No [	N/A	Comments:
	•					F

	9.2 Were field duplicates collected per the required frequency?	Yes [_]	No [_]	N/A 🔽	Comments:
SO	W □ QAPP (1 per 10) □ MADEP Option 1 (1 per 20) □ MADEP Option 3 (1 per 10) □				
	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes [_]	No [_]	N/A [J	Comments:
CTI	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results i	f the RPD	exceeds 50	%.	
0.0	Special QA/QC		3	+	, i
		E.			
	10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.	Yes [V]	No []	N/A[] I sodium	concertation is greater
conce	TION: If results for both total and dissolved are $\geq 5x$ the PQL and the dissolved entration is 10% higher than the total, flag both results as estimated (J). If total and olved concentrations are less than $5x$ the PQL and the difference exceeds $2x$ the flag both results as estimated (I)	then for .	the	total so were q	concentration is greater dien concentration. Risotts ealified estimated (3).

10.0	Application of Validation Qualifiers		•			4
	Was any of the data qualified?	±	4	* N	Yes No No N/A	A [_] Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

#### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

Version 2, April 2003

### OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

.11/13/0	Allila.	WM	Reviewer/Date_
	Ricardi	Chas	Sr. Review/Date
	65-1	360-118	Lab Report #
- 7			Lab Report #_

ammonia, specific conductance, chloride, sullate nitrate, nitrate

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following

tasks completed and recorded upon receipt of the sample(s) into the laboratory?

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0	Laboratory Deliverable Requirements	
	1.1 Laboratory Information: Was all of the following provided in the laboratory report Check items received.  Name of Laboratory Address Project ID Phone # Client Information: Name Address Client Contact	? Yes No NA Comments:  Sample identification – Field and Laboratory (IDs must be cross-referenced)
ACII	ON: If no, contact lab for submission of missing or illegible information.	
	1.2 Laboratory Report Certification Statement	Yes [ ] No [ ] N/A [ ] Comments:
	Does the laboratory report include a completed Analytical Report Certification in the	e required format?
ACTIO	ON: If no, contact lab for submission of missing certification or certification with correct	
	1.3 Laboratory Case Narrative:	Yes [] No [] N/A [] Comments:
	Narrative serves as an exception report for the project and method QA/QC performance	ce. A Narrative includes an explanation of each discrepancy on the
		Certification Statement.
ACTIO	ON: If no, contact lab for submission of missing or illegible information.	
	1.4 Chain of Custody (COC) copy present with all documentation completed?	Yes No No N/A Comments:
	Does the laboratory report include copies of Chain of Custody forms containing all samples	in this SDG?
	NOTE: Olin receives and maintains the original COC.	
ACTI	ON: If no, contact lab for submission of copy of missing completed COC.	

	Yes 🚺	No [_]	N/A []	Comments:	
Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered of Container type noted  Condition observed  PH verified (where applicable)  Field and lab II			on, temperatu	re requirement does	not apply).
ACTION: If no, contact lab for submission of missing or incomplete documentation.  1.5.1 Were the correct bottles and preservatives used?  Ammonia,— 1 Liter polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C	Yes 🗸	No [_]	N/A [_]	Comments:	e
Oil & Grease – 1 Liter glass/HCL to pH<2,cool to 4°C  Alkalinity – 1 Liter polyethylene/cool to 4°C  Chemical Oxygen Demand – 50 mL polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C					
Chloride, pH, sulfate - 50 mL polyethylene/cool to 4°C  Organic Carbon - 500 mL amber glass bottle/HCl or H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C  Sulfide - 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C  Specific conductance, TDS, TSS - 100 mL polyethylene/cool to 4°C				* .	
ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment	d.	/			St
1.5.2 Were all samples delivered to the laboratory without breakage?	Yes 🔼	No []	N/A []	Comments:	
1.5.3 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes [_]	No [	N/A [_]	Comments:	

		WEI CHEMISTRI FARAMI	ETERS BI VARIOUS METHOD	3	
	Results Section: Was the each sample?	e following information supplied in the	Yes No No	N/A [_] Comments:	
☑/ Field ID and Lab II ☑ Clean-up method	D ☐ Date and time ☐ Analysis method	collected Analyst Initials	Dilution Factor Date of preparation/extractio	moisture or solids	Reporting limi
Matrix	☐ Target analytes a	nd concentrations	Units (soils must be reported	in dry weight)	
ACTION: If no, contact	ct lab for submission of mi	ssing or incomplete information.			
1.7 QA/QC In for each sample	e batch?	wing information provided in the labora		N/A [_] Comments:	(g)
	LCS recoveries	MS/MSD recoveries and RPDs	Laboratory duplicate results (where	applicable)	
ACTION: If no contac	et lab for submission of mis	sing or incomplete information.			
ACTION. II no, comac	t lab for submission of mis	sing of meomplete information.			
2.0 Holding Times	<u>s</u>		Yes No No	N/A _] Comments:	
Have any tech	nical holding times, deterr	nined from date of collection to date of	f analysis, been exceeded? The hol	iding times are as follows:	
	AND THE RESIDENCE AND ADDRESS OF THE PROPERTY OF THE PERSON OF THE PERSO	gen demand, chloride, organic carbon,			e
*	y = 14 days	Sulfide, TDS, TSS = 7 days	pH = analyze immediately		
Nitrite ni	itrogen as N = 48 hrs	Nitrate + Nitrite as N = 28 days			
		ne with # of days exceeded on checklist			
ACTION: If technical judgment used to qualify		led qualify results (J). For water sample	les that are grossly exceeded (>2X	hold time) reject (R) all non-d	etect results. Professional
3.0 Labora	atory Method		Yes No No	N/A [_] Comments:	
3.1 Was the co	rrect laboratory method us	ed?			
ACTION: If no. contact	t lab to provide justification	n for method change compared to the re	quested method. Contact senior cher	mist to inform Client of change of	or to request variance.
	and the state of t	processor and the second control of the control of			

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	3.2 Are the practical quantitation li  ☐ SOW ☐ QAPP ☐ Lab		ied by the	Yes [	No []	N/A [_]	Comments:	
	Note: The MADEP QA/QC Guidelines do therefore all criteria will default to values stip define criteria, QA/QC requirements defaul may also apply.	oulated in the QAPP*. Where the QA	PP does not					
	Ammonia* □ = 0.1 mg/ L	Alkalinity**□ = 1 mg/L	Bic	arbonate Alka	alinity** 🗆	= 1 mg/L	Carbonate Alkalinity** $\square = 1 \text{ mg/L}$	
	Nitrate Nitrogen as N* ☐ = .05 mg/L	Nitrite Nitrogen as N* .01 mg	/L Ch	loride* □ = 1	mg/L		Hardness $*\Box = 2 \text{ mg/L}$	
	Spec. Cond.**  a umhos/cm	Total Organic Carbon** □ = 1 m	g/L C	il & Grease*	□ = 3 mg/I	4	Sulfate (EPA 300.0)* $\Box = 2 \text{ mg/I}$	Ĺ
	COD:* Low – 20 mg/L	COD* High - 50 mg/L □	TD	S* □ = 10 m	ng/L		TSS* $\square$ = 5 mg/L	
	pH* □ < 2 to > 12							
	Other parameter(list)	_PQL =	☐ Source o	fPQL=				
	Other parameter(list)	PQL=	☐ Source o	fPQL=		-		
ACTIO	N: If no, evaluate change with respect to san	nple matrix, preparation, dilution, mo	oisture, etc. If	sample PQL is	s indetermin	nate, contact la	b for explanation.	
				./				
	3.3 Are the appropriate parameter results pro	esent for each sample in the SDG?		Yes [V]	No []	N/A []	Comments:	
ACTIO	N: If no, check Request for Analysis to verify	y if method was ordered and COC to	verify that it	/			on of the missing data	
	3.4 If dilutions were required, were dilution in	factors reported?		Yes 🗾	No [_]	N/A []	Comments:	
ACTIO	N: If no, contact the lab for submission.			/				
4.0	Method Blanks			Yes	No []	N/A [_]	Comments:	
	4.1 Are the Method Blank Summaries prese	nt?						
ACTIO	N: If no, call the laboratory for submission of	f missing data.		,				
	4.2 Was a method blank analyzed for each 20 or less?	analysis batch of wet chemistry field	samples of	Yes 🔼	No []	N/A [_]	Comments:	

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ACTIO	ON: If no	, document discrepancy in case narrative and contact lab for justification. Consult sens	ior chemist fo	or action nee	eded.	
	4.3 Is th	ne method blank less than the PQL? (See Section 3.2 for PQLs).	Yes 🗾	No [_]	N/A [_]	Comments:
	according accord	any method blanks have positive results for wet chemistry parameters? Qualify data ng to the following: simple concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the	Yes [_]	No [	N/A [_]	Comments:
	32.	the concentration reported if greater than the PQL. $ \text{ample concentration is } > 5 \times \text{blank value, no qualification is needed.} $				
ACTI qualific		ny blank has positive results, list all the concentrations detected and flagging level (fla	agging level	= 5 × blank	value) on the c	hecklist. List all affected samples and their
5.0	Labora	atory Control Standards				
	5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes 🔟	No [_]	N/A [_]	Comments:
		o, call laboratory for LCS form submittal. If data is not available, use professional rmine qualification actions for data associated with the batch.	· .	/		
	5.2	Is a LCS Summary Form present?	Yes 🗾	No [_]	N/A []	Comments:
CTIC	ON: If no,	, contact lab for resubmission of missing data.			7	
	5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	Yes [_]	No [_]	N/A [_]	Comments:

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T .	CS	T	50.00	
		1	m	116.

Alkalinity** □ = 80-120%  Total Organic Carbon** □ = 80-120%  COD Low* □ = 80-120%  Hardness* □ = 85-115%	Bicarbonate Alkalinity** □ = 80-120%  TDS** □ = 80-120%  COD High* □ = 80-120%  Chloride* □ = 80-120%	Carbonate Alkalinity** □ = 80-120%  Oil & Grease* □ = 80-120%  Nitrate Nitrogen as N** □ = 85-115%  Sulfate (EPA 300.0)* □ = 75-125%	Specific Conductivity *□ = 80-120%  Ammonia Nitrogen as N* □ = 80-120%  Nitrite Nitrogen as N** □ = 75-120%  pH* □ = 98-102%  TSS* NA
Other parameter(list)	%R =	☐ Rec Limits=	-
Other parameter(list)	%R =	□ Rec Limits =	-
ACTION: If recovery is above the upper limit, within the batch as (J). If LCS recovery is <10%,		e batch as (J). If recovery is below the lower l	imit, qualify all positive and no-detect results
6.0 <u>Matrix Spikes</u>		#: -	
Matrix spikes may be collected at different fi specific schedules. Confirm spike requirement			*
ACTION: If no, contact senior chemist to see if a	or section to the control of the co	piked.  Yes [ ] No [ ] N/A [ ]	Comments:
6.2 Is the MS/MSD Recovery Form ACTION: If no, contact lab for resubmission of the contact lab for resubmissin contact lab for resubmission of the contact lab for resubmissio		Yes [ ] No [ ] N/A [ ]	Comments:

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6.3	Were matrix spikes analyzed at matrix?	the required frequency of 1 per 20 sai	mples per Yes [_] No [_]	N/A Comments:
ACTION: If a	ny matrix spike data is missing, call l	ab for resubmission.		
6.4	Are any wet chemistry analyte spi	ke recoveries outside of the QC limits?	Yes [_] No [_]	N/A Comments:
	NOTE: $%R = (SS)$	SR-SR) x 100%	Wh	ere: $SSR = Spiked$ sample result $SR = Sample$ result
		SA = Spike added		
MS/M	ISD Recovery Limits:			
Alkali	inity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHAT) □ = 74-125%
Chlori	ide*(SM 4500 Cl) □= 77-116%	Specific Conductivity * = NA	Total Organic Carbon* = NA	$TDS^{**} = NA$
Oil &	Grease* = NA	COD Low* □ = 61-142%	COD High* □ = 92-109%	Nitrate Nitrogen as N** □ = 75-119%
Nitrite	e Nitrogen as N** □ = 68-136%	Hardness* $\square = 70-130\%$	Sulfate (EPA 300.0)* □ = 75-125	% $pH^* = NA$ TSS* = NA
Other	parameter(list)	% R = _	□ Rec L	imits =
* = La	aboratory Limits ** = (	Olin QAPP Limits (MADEP has not	yet defined LCS recovery limits for	or wet chemistry analyses.)
NOTE		or an MS/MSD pair is outside of the cord by the laboratory on a non-project same		ary. Use professional judgment for the MS/MSD flags.
qualify positive	e results as estimated (J). If the reco	e spiked. Do not evaluate if sample conc veries of the MS and MSD are lower the detect, the results are considered unusable	an the lower control limit but > 30%	eries of the MS and MSD exceed the upper control limit, o, qualify both positive results and non-detects (J). If the
	boratory control limits apply when spondings are applied.	piked sample results fall within the norr	nal calibration range. If dilutions are	required due to high sample concentrations, the data is
6.5 Ar	re any RPDs for MS/MSD recoveries	outside of the QA/QC limits?		
NOTI	E: RPD = $\frac{S - D}{(S + D)/2}$ x 100% Wh	pere S = MS result D = MSD result	Yes [_] No [_]	N/A Comments:

	MS/MSD RPD Limits:						
	Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* =	= NA	Ammonia** (LACH	AT) □ = 8%	
	Chloride**(SM 4500 Cl) □ = 15%	Specific Conductivity * = NA	Total Organic Carbon*	* = NA	TDS** = NA Total	Organic Carbon*	= NA
	COD Low** □ = 14%	COD High** □ = 16%	Nitrate Nitrogen as N <sup>3</sup>	** 🗆 16%	Nitrite Nitrogen as I	N** □ = 16%	
	Oil & Grease* = NA	Hardness* = NA	Sulfate (EPA 300.0)*	□ = 10%	$pH^* = NA$	TSS* = NA	
	Other parameter(list)			🗆 :	RPD limit =		
	Other parameter(list)		RPD =		RPD limit =		
	* = Laboratory Limits	** = Olin QAPP Limits					
	(MADEP has not yet defined LC-	S recovery limits for wet chemistry	v analyses.)				
7.0	Laboratory Duplicate						
	Are the RPDs for the laboratory du	aplicates <20% unless otherwise spe	cified below? Yes [	No [	J N/A 🗹 C	omments:	
ACTIC	ON: If the RPD is greater than specific	ed limits, qualify all results for that ar	nalyte as estimated (J).				
	Alkalinity* = 4% Bicar	rbonate Alkalinity* = 4%	Carbonate alkalinity* = 4%	%	Oil & Grease* □ =	= 20%	
	pH* □ = 3% Spec	eific Conductivity *□ = 5%	TSS** □ = 6%		TDS** □ = 6%		
8.0	Sampling Accuracy						
	ajority of ground water samples a edicated tubing. Rinse blanks wil		process stream, or				
	8.1 Were rinsate blanks collected? associated samples from the senior of	Prior to evaluating rinsate blanks, chemist.	obtain a list of the Yes [	No [ &	N/ALI C	omments:	
	8.2 Do any rinsate blanks have posi-	tive results?	Yes [	No [	I N/A L C	omments:	

ACTIC	N: Evaluate rinsate results vs. blank results to determine if contaminant may be labor	atory-deriv	ed. If not la	ıb-related, qı	alify according to	o the table below.
	If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL	or the conce	entration repo	orted if greater	than the PQL.	
	If the sample concentration is $> 5 \times$ blank value, no qualification is needed.					
NOTE:	MADEP does not require the collection of rinsate blanks.					
9.0	Field Duplicates		/	/	*	11 S
	9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.	Yes [_]	No [	N/A []	Comments:	
	9.2 Were field duplicates collected per the required frequency?	Yes []	No []	N/A [』	Comments:	
SOW	☐ QAPP ☐ MADEP Option 1(1 per 20) ☐ MADEP Option 3 (1 per 10) ☐				,	
	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes []	No []	N/A [ ]	Comments:	
ACTIC	<b>ON</b> : RPD must be ≤50% for soil and water. Qualify data (J) for both sample results if	the RPD ex	ceeds 50%.	v		
			/	1		
	Was any of the data qualified?	Yes []	No [	N/A [_]	Comments:	
	If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.					

#### REFERENCES

LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999.

STL-Westfield, 2002. "Olin - General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

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### ANALYTICAL REPORT

Job Number: 360-11840-1

Job Description: PCMP Surfacewater 6300060010

For:
Olin Corporation
1186 Lower River Road
Charleston, TN 37310-0248

Attention: Mr. Steven Morrow

Joseph a. Cliams.

Designee for

Becky C Mason

Project Manager II

becky.mason@testamericainc.com

09/04/2007

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 253903-A, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.



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Laboratory Name:	TestAmerica Westfield	Project #:	360-11840-1
Project Location:		MADEP RTN1:	
	tifications for the following data set:[list L		
360-11840-(1-4, 6-8)	andatoria for the following data section 2	aboratory earnpie to manner (	*
Sample Matrices:	Groundwater Soil/Sedimer		Other:
MCP SW-846	2000年		A/1A() Other()
Methods Used		, , ,	4M²/9012 ( )
As specified in MADEI			SA()
Compendium of Analytical Methods. (check all that apply)	List Release Tracking Number (R     M - SW-846 Method 9014 or MAD     S - SW-846 Methods 7000 Series	EP Physiologically Available C	
An affirmative res	ponse to questions A, B, C and D is re	equired for "Presumptive Ce	rtainty" status
202 4	amples received by the laboratory in a co- ped on the Chain-of-Custody documental		(Yes) No <sup>1</sup>
B included in discuss in	A/QC procedures required for the specifical this report followed, including the required a narrative QC data that did not meet apport guidelines?	ement to note and	(es No <sup>1</sup>
C for "Presur the MADE	nalytical data included in this report meet nptive Certainty", as described in Section document CAM VII A, " Quality Assurar idelines for the Acquisition and Reporting	2.0 (a), (b), (c) and (d) of nce and Quality	€s N/A No1
and you	PH methods only: Was the VPH or EP modifications (see Section 11.3 of respec		Yes WA No
A respo	nse to questions E and F below is requ	uired for "Presumptive Certa	inty" status
	C performance standards and recomment nethods achieved?	ndations for the	Yes No1
F Were resu method(s)	ts for all analyte-list compounds/element reported?	s for the specified	Yes N/A Q
<sup>1</sup> All Negative	responses must be addressed in an atta	ached Environmental Laborator	ry case narrative.
	ttest under the pains and penalties of onsible for obtaining the information,		
analytical report is, t	the best of my knowledge and belief	, accurate and complete.	
Signature	Dun-Dem-	Position: Lab	oratory Director
	ne: Steven C. Hartmann	Date: _ 9	SAL SALVE SA
CAM VII A, Rev 3.2			April-04
TestAmeric	MADEP MA014 NELAP FL E87912 TOX NY DOH 10843 NELAP NJ MA008 TOX RI DOH 57 NELAP NY 10843 CT DPH 0494 NH DES 253901-A VT DECWSD	TestAmerica Westfield 53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707	Boston Service Center 148 Rangeway Rd N.Billerica, MA 01862 Tel:(978)667-1400 Fax:(978)567-7871

	MADE	MCP Ana	alytical Me	thod Repo	rt Certifica	tion Fo	orm		
Laboratory		TestAmeric	sava sea fear		The second second	ect #:	360-11	840-1	
Project Loc					MADEP F	RTN <sup>1</sup> :	I)		
		ations for the fo	llowing data set	:[list Laboratory	Sample ID Nun	nber(s)]			
360-11840		410		70					
Sample Ma	trices:	Groundwater	Soil/Se	ediment	Drinking Wate				
MCP SW-	846	8260B( )	8151A ( )	8330 ( )	6010B()	7470A/1A	255 AC	Other (	x )
Methods	Used	8270C( )	8081A()	VPH()	6020 ( )	9014M <sup>2</sup> /9			
A CAP +	d in MADEP	8082 ( )	8021B ( )	EPH()	7000 S³( )	7196A (	2		
Compendit Analytical N (check all t	Methods.	2 M - SW-846	Method 9014 o	oer (RTN), if kno r MADEP Physio Series List indiv	ologically Availa			Method	i
An affi	rmative respo	nse to questio	ns A, B, C and	D is required fo	or "Presumptiv	e Certain	ıty" statu:	s	
Α	Were all samp that described	les received by on the Chain-o	the laboratory i f-Custody docu	n a condition comentation for the	nsistent with e data set?		(Yes)	No	,1
В	that described on the Chain-of-Custody documentation for the data set?  Were all QA/QC procedures required for the specified analytical method(s) included in this report followed, including the requirement to note and discuss in a narrative QC data that did not meet appropriate performance standards or guidelines?							No	o <sup>1</sup>
С	for "Presumpti the MADEP do	ve Certainty", a ocument CAM \	is described in S /II A, " Quality A	rt meet all the re Section 2.0 (a), ( ssurance and C porting of Analy	b), (c) and (d) c tuality	f	Yes	<b>@</b>	No <sup>1</sup>
D				or EPH Method respective Meth		out	Yes		No <sup>1</sup>
	A response	to questions	E and F below	is required for	"Presumptive	Certainty	" status		
E		erformance sta nods achieved?		ommendations f	or the	37 11072	Yes	0	30
F	Were results f method(s) rep		st compounds/e	lements for the s	specified	- Work	Yes	<b>@</b>	No <sup>1</sup>
1	All Negative re	sponses must b	oe addressed in	an attached En	vironmental Lab	oratory ca	ase narrat	ve.	
inquiry of	those respons	sible for obtain	ning the inform	ies of perjury to lation, the mate belief, accurat	erial contained	in this	sonal		
analytical	report is, to th	No Best of my	7				***		
	Signature:	Jane -		<u> </u>	Position	: Laborat	tory Direc	ctor	
	Printed Name:	Steven C. H.	artmann		Date	: 914	164		
CAM VII A, Rev 3	3.2							April-04	
TestA	merica	MADEP MA014 NY DOH 10843 RI DOH 57 CT DPH 0494 VT DECWSD	NELAP FL E87812 TOX NELAP NJ MA008 TOX NELAP NY 10843 NH DES 253901-A	(4	TestAmerica Westfiel 53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707	d	148 Rangew N.Billerica, N Tel:(978)667 Fax:(978)667	ay Rd MA 01862 -1400	

#### CASE NARRATIVE

Client: Olin Corporation

Project: PCMP Surfacewater 6300060010

Report Number: 360-11840-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 08/22/2007; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.4°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2°C of the required temperature or method specified range. For samples with a specified temperature of 4°C, samples with a temperature ranging from just above freezing temperature of water to 6°C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

#### DISSOLVED METALS

Samples 360-11840-1 through 360-11840-4 and 360-11840-6 through 360-11840-8 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 08/23/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

#### TOTAL METALS

Samples 360-11840-1 through 360-11840-4 and 360-11840-6 through 360-11840-8 were analyzed for total metals in accordance with EPA SW846 Method 6010B. The samples were prepared and analyzed on 08/23/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, an abbreviated/modified MCP analyte list was reported for this job.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

#### **AMMONIA**

Samples 360-11840-1 through 360-11840-4 and 360-11840-6 through 360-11840-8 were analyzed for ammonia in accordance with LACHAT 10-107-06-1. The samples were prepared on 08/28/2007, 08/30/2007 and 09/04/2007 and analyzed on 08/30/2007 and 09/04/2007.

All QC performance standards and recommendations for this specific method were achieved.

Samples 360-11840-2(5X), 360-11840-3(10X), 360-11840-4(5X) and 360-11840-8(5X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high concentration.

#### **ANIONS**

Samples 360-11840-1 through 360-11840-4 and 360-11840-6 through 360-11840-8 were analyzed for anions in accordance with EPA Method 300.0. The samples were analyzed on 08/23/2007, 08/24/2007 and 08/25/2007.

All QC performance standards and recommendations for this specific method were achieved with the exception of:

Due to high Chloride concentration, samples 360-11840-(1-3, 6-8, 6MS/MSD) required a 10X dilution for Nitrite. The 10X dilutions were performed outside of holding time.

Samples 360-11840-1 through 360-11840-4(10X), 360-11840-4(5X) and 360-11840-6 through 360-11840-8(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentrations.

#### SPECIFIC CONDUCTANCE (CONDUCTIVITY)

Samples 360-11840-1 through 360-11840-4 and 360-11840-6 through 360-11840-8 were analyzed for Specific Conductance (Conductivity) in accordance with SM 2510B. The samples were analyzed on 08/23/2007.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

#### METHOD SUMMARY

Client: Olin Corporation

Job Number: 360-11840-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Dissolved Metals	TAL WFD	SW846 6010B	
Total Metals Sample Filtration performed in the Field Acid Digestion of Aqueous Samples and Extracts for	TAL WFD TAL WFD TAL WFD	SW846 6010B	FIELD_FLTRD SW846 3010A
Lachat Ammonia-Nitrogen Distillation/Ammonia	TAL WFD TAL WFD	QuickChem 10	-107-06-1 Distill/Ammonia
Chloride & Sulfate	TAL WFD	40CFR136A 30	0.00
Nitrate & Nitrite	TAL WFD	40CFR136A 30	0.00
Conductivity, Specific Conductance	TAL WFD	SM18 SM 2510	DB

#### Lab References:

TAL WFD = TestAmerica Westfield

#### Method References:

40CFR136A = "Methods for Organic Chemical Analysis of Municipal Industrial Wastewater", 40CFR, Part 136, Appendix A, October 26, 1984 and subsequent revisions.

QuickChem = Lachat Instruments

SM18 = "Standard Methods For The Examination Of Water And Wastewater", 18th Edition, 1992.

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-11840-1

Method	Analyst	Anaiyst ID
SW846 6010B	Nasiatka, Ellen M	EMN
QuickChem 10-107-06-1	Lalashius, Andrew L	ALL
40CFR136A 300.0	Lalashius, Andrew L	ALL
SM18 SM 2510B	Emerich, Rich W	RWE

### SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-11840-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received	
360-11840-1	ISCO-3	Water	08/22/2007 0850	08/22/2007 1630	
360-11840-2	ISCO-2	Water	08/22/2007 0905	08/22/2007 1630	
360-11840-3	PZ-16 RSW	Water	08/22/2007 0954	08/22/2007 1630	
360-11840-4	SD-17	Water	08/22/2007 1030	08/22/2007 1630	
360-11840-6	ISCO-1	Water	08/22/2007 1100	08/22/2007 1630	
360-11840-6MS	ISCO-1 MS	Water	08/22/2007 1100	08/22/2007 1630	
360-11840-6MSD	ISCO-1 MSD	Water	08/22/2007 1100	08/22/2007 1630	
360-11840-7	ISCO-1 DUP	Water	08/22/2007 1100	08/22/2007 1630	
360-11840-8	PZ-17RR	Water	08/22/2007 1010	08/22/2007 1630	

### **SAMPLE RESULTS**

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248 Job Number: 360-11840-1

Client Sample ID: ISCO-3 Lab Sample ID: 360-11840-1 Date Sampled: 08/22/2007 0850 Date Received: 08/22/2007 1630

Analyte		Result/Qu	ualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B				Date A	nalyzed:	08/23/2007 1244	
Aluminum		6.1	J	ug/L	6.0	100	1.0
Chromium		ND		ug/L	0.68	5.0	1.0
Sodium		61000	2	ug/L	95	2000	1.0
Method: 6010B				Date A	nalyzed:	08/23/2007 1433	
Prep Method: 3010A				Date P	epared:	08/23/2007 0837	
Aluminum		270		ug/L	6.0	100	1.0
Chromium		27		ug/L	0.68	5.0	1.0
Sodium	¥)-	49000	7	ug/L	95	2000	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: ISCO-3 Lab Sample ID: 360-11840-1 Date Sampled: 08/22/2007 0850 Date Received: 08/22/2007 1630

Analyte	Result/Qualifi	er	Unit	RL	RL	Dilution
Method: 10-107-06-1			Date Anal	lyzed:	08/30/2007 1525	
Prep Method: Distill/Ammonia			Date Prep	pared:	08/28/2007 1145	
Ammonia	4.8		mg/L	0.10	0.10	1.0
Method: 300.0			Date Anal	lyzed:	08/23/2007 1341	
Sulfate	50		mg/L	2.0	2.0	1.0
Nitrate as N	0.68		mg/L	0.05	0.050	1.0
Method: 300.0			Date Ana	lyzed:	08/24/2007 1929	
Nitrite as N	ND	Н	mg/L	0.10	0.10	10
Chloride	150		mg/L	10	10	10
Method: SM 2510B			Date Ana	lyzed:	08/23/2007 1009	
Specific Conductance	690		umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: ISCO-2 Lab Sample ID: 360-11840-2 Date Sampled: 08/22/2007 0905 Date Received: 08/22/2007 1630

Analyte	Result/Qu	ualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08/2	3/2007 1247	
Aluminum	63	J	ug/L	6.0	100	1.0
Chromium	7.0		ug/L	0.68	5.0	1.0
Sodium	120000		ug/L	95	2000	1.0
Method: 6010B			Date A	nalyzed: 08/2	3/2007 1435	
Prep Method: 3010A			Date P	repared: 08/2	3/2007 0837	
Aluminum	2300		ug/L	6.0	100	1.0
Chromium	420		ug/L	0.68	5.0	1.0
Sodium	110000		ug/L	95	2000	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: ISCO-2 Lab Sample ID: 360-11840-2 Date Sampled: 08/22/2007 0905 Date Received: 08/22/2007 1630

Analyte	Result/Qu	alifier	Unit	RL	RL	Dilution
Method: 10-107-06-1			Date Anal	lyzed:	08/30/2007 1559	
Prep Method: Distill/Ammonia			Date Prep	pared:	08/30/2007 0925	
Ammonia	48		mg/L	0.50	0.50	5.0
Method: 300.0			Date Anal	lyzed:	08/23/2007 1356	
Nitrate as N	3.5		mg/L	0.05	0.050	1.0
Method: 300.0			Date Ana	lyzed:	08/24/2007 2000	
Sulfate	330		mg/L	20	20	10
Nitrite as N	ND	Н	mg/L	0.10	0.10	10
Chloride	220		mg/L	10	10	10
Method: SM 2510B			Date Ana	lyzed:	08/23/2007 1016	
Specific Conductance	1400		umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248 Job Number: 360-11840-1

Client Sample ID: PZ-16 RSW Lab Sample ID: 360-11840-3 Date Sampled: 08/22/2007 0954 Date Received: 08/22/2007 1630

Analyte	Result/Qu	alifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08	/23/2007 1249	
Aluminum	46	J	ug/L	6.0	100	1.0
Chromium	57		ug/L	0.68	5.0	1.0
Sodium	200000	3	ug/L	95	2000	1.0
Method: 6010B			Date A	nalyzed: 08	/23/2007 1438	
Prep Method: 3010A			Date P	repared: 08	/23/2007 0837	
Aluminum	6300		ug/L	6.0	100	1.0
Chromium	1500		ug/L	0.68	5.0	1.0
Sodium	180000	3	ug/L	95	2000	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: PZ-16 RSW Lab Sample ID: 360-11840-3 Date Sampled: 08/22/2007 0954 Date Received: 08/22/2007 1630

Analyte	Result/Qu	alifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		F1	Date Anal	lyzed: 08	3/30/2007 1602	
Prep Method: Distill/Ammonia			Date Prep	pared: 08	3/30/2007 0925	
Ammonia	81		mg/L	1.0	1.0	10
Method: 300.0			Date Ana	lyzed: 08	3/23/2007 1411	
Nitrate as N	3.7		mg/L	0.050	0.050	1.0
Method: 300.0			Date Ana	lyzed: 08	3/24/2007 2030	
Sulfate	650		mg/L	20	20	10
Nitrite as N	ND	н	mg/L	0.10	0.10	10
Chloride	350		mg/L	10	10	10
Method: SM 2510B			Date Ana	lyzed: 08	3/23/2007 1023	
Specific Conductance	2400		umhos/cm	1.0	1.0	1.0

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248 Job Number: 360-11840-1

Client Sample ID: SD-17 Lab Sample ID: 360-11840-4 Date Sampled: 08/22/2007 1030 Date Received: 08/22/2007 1630

Analyte	Result/Qu	alifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed:	08/23/2007 1252	
Aluminum	26	J	ug/L	6.0	100	1.0
Chromium	29		ug/L	0.68	5.0	1.0
Sodium	170000	7	ug/L	95	2000	1.0
Method: 6010B		1000	Date A	nalyzed:	08/23/2007 1440	
Prep Method: 3010A			Date P	repared:	08/23/2007 0837	
Aluminum	2900		ug/L	6.0	100	1.0
Chromium	680		ug/L	0.68	5.0	1.0
Sodium	150000	>	ug/L	95	2000	1.0

Job Number: 360-11840-1 Mr. Steven Morrow Olin Corporation

1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: SD-17 Lab Sample ID: 360-11840-4 Date Sampled: 08/22/2007 1030 Date Received: 08/22/2007 1630

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: 10-107-06-1		Date Ana	lyzed:	08/30/2007 1603	
Prep Method: Distill/Ammonia		Date Prep	pared:	08/30/2007 0925	
Ammonia	27	mg/L	0.50	0.50	5.0
Method: 300.0		Date Ana	lyzed:	08/24/2007 0000	
Sulfate	180	mg/L	10	10	5.0
Nitrate as N	5.6	mg/L	0.25	0.25	5.0
Nitrite as N	ND	mg/L	0.05	0.050	5.0
Method: 300.0		Date Ana	lyzed:	08/25/2007 0001	
Chloride	370	mg/L	10	10	10
Method: SM 2510B	e e	Date Ana	lyzed:	08/23/2007 1030	
Specific Conductance	1700	umhos/cm	1.0	1.0	1.0

Job Number: 360-11840-1

Mr. Steven Morrow Olin Corporation 1186 Lower River Road Charleston, TN 37310-0248

Client Sample ID: ISCO-1 Lab Sample ID: 360-11840-6 Date Sampled: 08/22/2007 1100 Date Received: 08/22/2007 1630

Analyte	Result/Qu	ıalifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08/2	3/2007 1229	
Aluminum	7.2	J	ug/L	6.0	100	1.0
Chromium	3.4	J	ug/L	0.68	5.0	1.0
Sodium	51000	3	ug/L	95	2000	1.0
Method: 6010B		27	Date A	nalyzed: 08/2	3/2007 1425	
Prep Method: 3010A			Date P	repared: 08/2	3/2007 0837	
Aluminum	94	J	ug/L	6.0	100	1.0
Chromium	13	270	ug/L	0.68	5.0	1.0
Sodium	46000	3	ug/L	95	2000	1.0

Job Number: 360-11840-1

Client Sample ID: ISCO-1 Lab Sample ID: 360-11840-6

Date Sampled: 08/22/2007 1100 Date Received: 08/22/2007 1630

Analyte	Result/Qual	ifier	Unit	RL	RL	Dilution
Method: 10-107-06-1			Date Ana	lyzed:	09/04/2007 1325	
Prep Method: Distill/Ammonia			Date Prep	pared:	09/04/2007 1127	
Ammonia	14		mg/L	0.10	0.10	1.0
Method: 300.0			Date Ana	lyzed:	08/23/2007 1456	
Sulfate	76		mg/L	2.0	2.0	1.0
Nitrate as N	0.93		mg/L	0.050	0.050	1.0
Method: 300.0			Date Ana	lyzed:	08/24/2007 2301	
Nitrite as N	0.10	Н	mg/L	0.10	0.10	10
Chloride	78		mg/L	10	10	10
Method: SM 2510B			Date Ana	lyzed:	08/23/2007 1044	
Specific Conductance	510		umhos/cm	1.0	1.0	1.0

Job Number: 360-11840-1

Client Sample ID: ISCO-1 DUP Lab Sample ID: 360-11840-7 Date Sampled: 08/22/2007 1100 Date Received: 08/22/2007 1630

Analyte	Result/Qu	alifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08/2	3/2007 1254	
Aluminum	8.5	J	ug/L	6.0	100	1.0
Chromium	3.6	J	ug/L	0.68	5.0	1.0
Sodium	51000	2	ug/L	95	2000	1.0
Method: 6010B			Date A	nalyzed: 08/2	3/2007 1443	
Prep Method: 3010A			Date P	repared: 08/2	3/2007 0837	
Aluminum	100		ug/L	6.0	100	1.0
Chromium	13		ug/L	0.68	5.0	1.0
Sodium	43000	3	ug/L	95	2000	1.0

Job Number: 360-11840-1

Client Sample ID: ISCO-1 DUP Lab Sample ID: 360-11840-7 Date Sampled: 08/22/2007 1100 Date Received: 08/22/2007 1630

Analyte	Result/Quali	fier	Unit	RL	RL	Dilution
Method: 10-107-06-1			Date Ana	lyzed:	08/30/2007 1535	
Prep Method: Distill/Ammonia			Date Prep	pared:	08/30/2007 0925	
Ammonia	15		mg/L	0.10	0.10	1.0
Method: 300.0			Date Ana	lyzed:	08/23/2007 1541	
Sulfate	75		mg/L	2.0	2.0	1.0
Nitrate as N	0.93		mg/L	0.05	0.050	1.0
Method: 300.0			Date Ana	lyzed:	08/24/2007 2130	
Nitrite as N	0.10	Н	mg/L	0.10	0.10	10
Chloride	76		mg/L	10	10	10
Method: SM 2510B			Date Ana	lyzed:	08/23/2007 1058	
Specific Conductance	520		umhos/cm	1.0	1.0	1.0

Job Number: 360-11840-1

Client Sample ID: PZ-17RR Lab Sample ID: 360-11840-8 Date Sampled: 08/22/2007 1010 Date Received: 08/22/2007 1630

Analyte	Result/Q	ualifier	Unit	MDL	RL	Dilution
Method: Dissolved-6010B			Date A	nalyzed: 08	3/23/2007 1256	
Aluminum	26	J	ug/L	6.0	100	1.0
Chromium	34		ug/L	0.68	5.0	1.0
Sodium	170000		ug/L	95	2000	1.0
Method: 6010B			Date A	nalyzed: 08	3/23/2007 1450	
Prep Method: 3010A			Date P	repared: 08	3/23/2007 0837	
Aluminum	2700		ug/L	6.0	100	1.0
Chromium	640		ug/L	0.68	5.0	1.0
Sodium	160000		ug/L	95	2000	1.0

Job Number: 360-11840-1

Client Sample ID: PZ-17RR Lab Sample ID: 360-11840-8 Date Sampled: 08/22/2007 1010 Date Received: 08/22/2007 1630

Analyte	Result/Qual	ifier	Unit	RL	RL	Dilution
Method: 10-107-06-1			Date Anal	lyzed:	08/30/2007 1604	
Prep Method: Distill/Ammonia			Date Prep	pared:	08/30/2007 0925	
Ammonia	31		mg/L	0.50	0.50	5.0
Method: 300.0			Date Anal	lyzed:	08/23/2007 1627	
Nitrate as N	4.5		mg/L	0.05	0.050	1.0
Method: 300.0			Date Anal	lyzed:	08/24/2007 2100	
Sulfate	210		mg/L	20	20	10
Nitrite as N	ND	H	mg/L	0.10	0.10	10
Chloride	390		mg/L	10	10	10
Method: SM 2510B			Date Anal	lyzed:	08/23/2007 1105	
Specific Conductance	1800		umhos/cm	1.0	1.0	1.0

#### **DATA REPORTING QUALIFIERS**

Client: Olin Corporation

Job Number: 360-11840-1

Lab Section	Qualifier	Description	
Metals		9 9	80
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.	
General Chemistry			
	н	Sample was prepped or analyzed beyond the specified holding time	

### **QUALITY CONTROL RESULTS**

Job Number: 360-11840-1

#### **QC Association Summary**

		Report			
Lab Sample ID	Client Sample ID	Basis	Client Matrix	Method	Prep Batch
Vietals	30.00.30.00		7,		
Prep Batch: 360-22474	1.34		# *	2 1 14 0 0000000000000000000000000000000	NUMBER OF THE PROPERTY OF THE
CS 360-22474/2-A	Lab Control Spike	Т	Water	3010A	
CSD 360-22474/3-A	Lab Control Spike Duplicate	T	Water	3010A	
MB 360-22474/1-A	Method Blank	T	Water	3010A	
360-11840-1	ISCO-3	T	Water	3010A	
360-11840-2	ISCO-2	T	Water	3010A	
360-11840-3	PZ-16 RSW	Т	Water	3010A	
360-11840-4	SD-17	Т	Water	3010A	
360-11840-6	ISCO-1	T	Water	3010A	
860-11840-6MS	Matrix Spike	Т	Water	3010A	
360-11840-6MSD	Matrix Spike Duplicate	Т	Water	3010A	
360-11840-7	ISCO-1 DUP	Т	Water	3010A	XI.
360-11840-8	PZ-17RR	Ť	Water	3010A	
Analysis Batch:360-22	490				
CS 360-22490/7	Lab Control Spike	T	Water	6010B	
.CSD 360-22490/18	Lab Control Spike Duplicate	T	Water	6010B	
/IB 360-22490/8	Method Blank	Т	Water	6010B	
860-11840-1	ISCO-3	D	Water	6010B	
60-11840-2	ISCO-2	D	Water	6010B	
360-11840-3	PZ-16 RSW	D	Water	6010B	
360-11840-4	SD-17	D	Water	6010B	
360-11840-6	ISCO-1	D	Water	6010B	
360-11840-6MS	Matrix Spike	D	Water	6010B	
360-11840-6MSD	Matrix Spike Duplicate	D	Water	6010B	
360-11840-7	ISCO-1 DUP	D	Water	6010B	
360-11840-8	PZ-17RR	D	Water	6010B	
Analysis Batch:360-22					
.CS 360-22474/2-A	Lab Control Spike	T	Water	6010B	360-22474
CSD 360-22474/3-A	Lab Control Spike Duplicate	Т	Water	6010B	360-22474
MB 360-22474/1-A	Method Blank	T	Water	6010B	360-22474
360-11840-1	ISCO-3	T	Water	6010B	360-22474
360-11840-2	ISCO-2	T	Water	6010B	360-22474
60-11840-3	PZ-16 RSW	T	Water	6010B	360-22474
60-11840-4	SD-17	T	Water	6010B	360-22474
60-11840-6	ISCO-1	T	Water	6010B	360-22474
60-11840-6MS	Matrix Spike	- <b>T</b>	Water	6010B	360-22474
360-11840-6MSD	Matrix Spike Duplicate	T	Water	6010B	360-22474
360-11840-7	ISCO-1 DUP	T	Water	6010B	360-22474
360-11840-8	PZ-17RR	Т	Water	6010B	360-22474

### Report Basis D = Dissolved

T = Total

#### TestAmerica Westfield

Job Number: 360-11840-1

#### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry	***				
Analysis Batch:360-2	2497	t to	annominations		11-1-1-1 aminimize prima
LCS 360-22497/5	Lab Control Spike	Т	Water	SM 2510B	
MB 360-22497/7	Method Blank	Ť	Water	SM 2510B	
360-11840-1	ISCO-3	Ť	Water	SM 2510B	
360-11840-2	ISCO-2	Ť	Water	SM 2510B	
360-11840-3	PZ-16 RSW	Ť	Water	SM 2510B	
360-11840-4	SD-17	Ť	Water	SM 2510B	
360-11840-6	ISCO-1	Ť	Water	SM 2510B	
360-11840-6DU	Duplicate	Ť	Water	SM 2510B	
360-11840-7	ISCO-1 DUP	Ť	Water	SM 2510B	
360-11840-8	PZ-17RR	Ť	Water	SM 2510B	
Analysis Batch:360-2	2524				
LCS 360-22524/2	Lab Control Spike	Τ.	Water	300.0	
MB 360-22524/1	Method Blank	τ̈́	Water	300.0	
360-11840-1	ISCO-3	Ť	Water	300.0	
360-11840-6	ISCO-1	τ̈́	Water	300.0	
860-11840-6MS	Matrix Spike	Ť	Water	300.0	
360-11840-6MSD	Matrix Spike Duplicate	Ť	Water	300.0	
360-11840-7	ISCO-1 DUP	Ť	Water	300.0	
Analysis Batch:360-2	2525				
CS 360-22525/2	Lab Control Spike	Т	Water	300.0	
MB 360-22525/1	Method Blank	T	Water	300.0	
360-11840-4	SD-17	Ť	Water	300.0	
Analysis Batch:360-2	2529				
.CS 360-22529/2	Lab Control Spike	T	Water	300.0	
MB 360-22529/1	Method Blank	Ť	Water	300.0	
860-11840-1	ISCO-3	Т	Water	300.0	
360-11840-2	ISCO-2	Ť	Water	300.0	
860-11840-3	PZ-16 RSW	T	Water	300.0	
860-11840-6	ISCO-1	Ť	Water	300.0	
60-11840-6MS	Matrix Spike	Ť	Water	300.0	
60-11840-6MSD	Matrix Spike Duplicate	Ť	Water	300.0	
60-11840-7	ISCO-1 DUP	Ť	Water	300.0	
60-11840-8	PZ-17RR	Ť	Water	300.0	
Analysis Batch:360-2	2530				
CS 360-22530/2	Lab Control Spike	Т	Water	300.0	
AB 360-22530/1	Method Blank	Ť	Water	300.0	
360-11840-4	SD-17	÷	Water	300.0	

Job Number: 360-11840-1

#### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-2	22569			Samont Pananaman Anno	
LCS 360-22569/2	Lab Control Spike	Т	Water	300.0	
MB 360-22569/1	Method Blank	Т	Water	300.0	
360-11840-1	ISCO-3	T	Water	300.0	
360-11840-2	ISCO-2	Т	Water	300.0	
860-11840-3	PZ-16 RSW	T	Water	300.0	
360-11840-7	ISCO-1 DUP	Ť	Water	300.0	
360-11840-8	PZ-17RR	Т	Water	300.0	
Analysis Batch:360-2	22570				
CS 360-22570/2	Lab Control Spike	Т	Water	300.0	
MB 360-22570/1	Method Blank	T	Water	300.0	
360-11840-6	ISCO-1	T	Water	300.0	
360-11840-6MS	Matrix Spike	T	Water	300.0	
360-11840-6MSD	Matrix Spike Duplicate	Т	Water	300.0	2
Analysis Batch:360-2	22590				
CS 360-22590/2	Lab Control Spike	T	Water	300.0	
MB 360-22590/1	Method Blank	T	Water	300.0	
60-11840-1	ISCO-3	Ť	Water	300.0	
60-11840-2	ISCO-2	T	Water	300.0	
60-11840-3	PZ-16 RSW	Т	Water	300.0	
60-11840-7	ISCO-1 DUP	T	Water	300.0	
60-11840-8	PZ-17RR	Ť	Water	300.0	
Analysis Batch:360-2	2591				
CS 360-22591/2	Lab Control Spike	T	Water	300.0	
MB 360-22591/1	Method Blank	Т	Water	300.0	
60-11840-4	SD-17	T	Water	300.0	
60-11840-6	ISCO-1	Т	Water	300.0	
860-11840-6MS	Matrix Spike	T	Water	300.0	
60-11840-6MSD	Matrix Spike Duplicate	T	Water	300.0	
Prep Batch: 360-2262	25				
.CS 360-22625/2-A	Lab Control Spike	T	Water	Distill/Ammonia	
ИВ 360-22625/1-A	Method Blank	Т	Water	Distill/Ammonia	
60-11840-1	ISCO-3	Т	Water	Distill/Ammonia	
Prep Batch: 360-2271					
.CS 360-22719/2-A	Lab Control Spike	T	Water	Distill/Ammonia	
/IB 360-22719/1-A	Method Blank	Т	Water	Distill/Ammonia	
60-11840-2	ISCO-2	Т	Water	Distill/Ammonia	
60-11840-3	PZ-16 RSW	T	Water	Distill/Ammonia	
60-11840-4	SD-17	T	Water	Distill/Ammonia	
60-11840-7	ISCO-1 DUP	T	Water	Distill/Ammonia	
360-11840-8	PZ-17RR	Т	Water	Distill/Ammonia	

Job Number: 360-11840-1

#### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-2	2828			······································	
LCS 360-22625/2-A	Lab Control Spike	Т	Water	10-107-06-1	360-22625
MB 360-22625/1-A	Method Blank	Т	Water	10-107-06-1	360-22625
360-11840-1	ISCO-3	Т	Water	10-107-06-1	360-22625
Analysis Batch:360-2	2829				
LCS 360-22719/2-A	Lab Control Spike	Т	Water	10-107-06-1	360-22719
MB 360-22719/1-A	Method Blank	Т	Water	10-107-06-1	360-22719
360-11840-2	ISCO-2	T	Water	10-107-06-1	360-22719
360-11840-3	PZ-16 RSW	T	Water	10-107-06-1	360-22719
360-11840-4	SD-17	Т	Water	10-107-06-1	360-22719
360-11840-7	ISCO-1 DUP	T	Water	10-107-06-1	360-22719
360-11840-8	PZ-17RR	T	Water	10-107-06-1	360-22719
Prep Batch: 360-2285	52				
LCS 360-22852/2-A	Lab Control Spike	Т	Water	Distill/Ammonia	
MB 360-22852/1-A	Method Blank	T	Water	Distill/Ammonia	
360-11840-6	ISCO-1	Т	Water	Distill/Ammonia	
360-11840-6MS	Matrix Spike	T	Water	Distill/Ammonia	
360-11840-6MSD	Matrix Spike Duplicate	T	Water	Distill/Ammonia	
Analysis Batch:360-2	2858				
LCS 360-22852/2-A	Lab Control Spike	Т	Water	10-107-06-1	360-22852
MB 360-22852/1-A	Method Blank	T	Water	10-107-06-1	360-22852
360-11840-6	ISCO-1	T	Water	10-107-06-1	360-22852
360-11840-6MS	Matrix Spike	Т	Water	10-107-06-1	360-22852
360-11840-6MSD	Matrix Spike Duplicate	Т	Water	10-107-06-1	360-22852

Report Basis

T = Total

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22474

Method: 6010B Preparation: 3010A

Lab Sample ID: MB 360-22474/1-A

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/23/2007 1413 Date Prepared: 08/23/2007 0837 Analysis Batch: 360-22501 Prep Batch: 360-22474

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A

Initial Weight/Volume: 50 mL Final Weight/Volume: 50 mL

Analyte	Result	Qual	MDL	RL
Aluminum	ND		6.0	100
Chromium	ND		0.68	5.0
Sodium	ND		95	2000

Lab Control Spike/

Lab Control Spike Duplicate Recovery Report - Batch: 360-22474

Method: 6010B Preparation: 3010A

LCS Lab Sample ID: LCS 360-22474/2-A

Client Matrix:

Water 1.0

Dilution:

Date Prepared:

Date Analyzed:

08/23/2007 1420 08/23/2007 0837 Analysis Batch: 360-22501 Prep Batch: 360-22474

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A

Initial Weight/Volume:

50 mL

Final Weight/Volume:

50 mL

LCSD Lab Sample ID: LCSD 360-22474/3-A

Client Matrix:

Water

Dilution:

Date Analyzed: Date Prepared:

1.0

08/23/2007 1423 08/23/2007 0837 Analysis Batch: 360-22501 Prep Batch: 360-22474

Units: ug/L

Instrument ID: Varian 720 ES ICP

N/A

Lab File ID:

Initial Weight/Volume: 50 mL

Final Weight/Volume: 50 mL

		9	% Rec.					
Analyte		LCS	LCSD	Limit	RPD	<b>RPD Limit</b>	LCS Qual	LCSD Qual
	Arriva 2000		w ************************************		**********		***********	
Aluminum		92	97	80 - 120	5	20		
Chromium		93	98	80 - 120	5	20		
Sodium		90	95	80 - 120	5	20		
					1			

Client: Olin Corporation

Job Number: 360-11840-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22474

Method: 6010B

MS Lab Sample ID:

360-11840-6

Preparation: 3010A

Client Matrix:

Water

Analysis Batch: 360-22501

Instrument ID: Varian 720 ES ICP

N/A Lab File ID:

Dilution:

1.0

Prep Batch: 360-22474

Initial Weight/Volume: 50 mL

Date Analyzed: Date Prepared: 08/23/2007 1428 08/23/2007 0837 Final Weight/Volume: 50 mL

MSD Lab Sample ID: 360-11840-6

Analysis Batch: 360-22501

Instrument ID: Varian 720 ES ICP

Client Matrix: Dilution:

Water 1.0

Prep Batch: 360-22474

Lab File ID: N/A

Initial Weight/Volume: 50 mL

Date Analyzed: Date Prepared:

08/23/2007 1430 08/23/2007 0837 Final Weight/Volume: 50 mL

	%	Rec.				
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual MSD Qual
Aluminum	96	95	75 - 125	2	20	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Chromium	96	94	75 - 125	2	20	
Sodium	95	104	75 - 125	3	20	

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22490

Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-22490/8

Client Matrix: Water

Dilution:

1.0

Date Analyzed: 08/23/2007 1234

Date Prepared: N/A

Analysis Batch: 360-22490

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A

Initial Weight/Volume:

Final Weight/Volume: mL

Analyte	Result	Qual	MDL	RL	
Aluminum	ND	VM	6.0	100	-
Chromium	ND		0.68	5.0	
Sodium	ND		95	2000	

Lab Control Spike/

Lab Control Spike Duplicate Recovery Report - Batch: 360-22490

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-22490/7

Client Matrix:

Water 1.0

Dilution:

Date Analyzed:

08/23/2007 1232

Date Prepared:

N/A

Analysis Batch: 360-22490

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A

Initial Weight/Volume: Final Weight/Volume:

10 mL

LCSD Lab Sample ID: LCSD 360-22490/18

Client Matrix:

Water 1.0

Dilution:

08/23/2007 1314 Date Analyzed:

Date Prepared:

N/A

Analysis Batch: 360-22490

Prep Batch: N/A

Units: ug/L

Instrument ID:

Varian 720 ES ICP

Lab File ID:

Initial Weight/Volume:

Final Weight/Volume: 10 mL

	2	6 Rec.			
Analyte	LCS	LCSD	Limit	RPD	RPD Limit LCS Qual LCSD Qual
THE PROPERTY OF THE PARTY OF TH	1-101-10	Amou	mot 479 1 1		And more than the month of the state of the
Aluminum	95	98	80 - 120	4	20
Chromium	95	98	80 - 120	3	20
Sodium	94	97	80 - 120	3	20
	1	/		1	

Client: Olin Corporation

Job Number: 360-11840-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22490

Method: 6010B

MS Lab Sample ID:

360-11840-6

Preparation: N/A

Client Matrix:

Water

Analysis Batch: 360-22490

Instrument ID: Varian 720 ES ICP

Lab File ID:

Dilution: Date Analyzed:

Initial Weight/Volume:

Date Prepared:

08/23/2007 1237 N/A

Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-11840-6

Analysis Batch: 360-22490

Prep Batch: N/A

Instrument ID: Varian 720 ES ICP

Client Matrix: Dilution:

Water 1.0

Prep Batch: N/A

Lab File ID: N/A Initial Weight/Volume:

Date Analyzed: Date Prepared:

08/23/2007 1239

N/A

Final Weight/Volume: 10 mL

Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual	MSD Qual
Aluminum	108	104	75 - 125	4	20	10/11 <del>-11-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-</del>	
Chromium	106	102	75 - 125	4	20		
Sodium	96	86	75 - 125	3 /	20		

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22625

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-22625/1-A

Client Matrix: Water

Date Prepared: 08/28/2007 1145

Date Analyzed: 08/30/2007 1504

Analysis Batch: 360-22828 Prep Batch: 360-22625

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID:

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

Analyte

Dilution:

Ammonia

Result

ND

Qual

RL

RL

0.10

0.10

Lab Control Spike - Batch: 360-22625

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-22625/2-A

Client Matrix: Water

Dilution:

1.0

Date Analyzed: 08/30/2007 1505 Date Prepared: 08/28/2007 1145 Analysis Batch: 360-22828 Prep Batch: 360-22625

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: 50 mL

Analyte

Spike Amount

10.0

Result

% Rec.

Limit

Qual

Ammonia

9.46

95

85 - 115

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22719

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-22719/1-A

Client Matrix: Water

Dilution: 1.0

Date Analyzed: 08/30/2007 1527 Date Prepared: 08/30/2007 0925 Analysis Batch: 360-22829 Prep Batch: 360-22719

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

Analyte Result

ND

Qual

RL

RL

0.10 0.10

Lab Control Spike - Batch: 360-22719

Units: mg/L

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-22719/2-A

Client Matrix: Dilution:

Ammonia

Water 1.0

Date Analyzed: 08/30/2007 1528 Date Prepared: 08/30/2007 0925 Analysis Batch: 360-22829 Prep Batch: 360-22719

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

Qual Spike Amount Result % Rec. Limit Analyte 85 - 115 9.50 10.0 95 Ammonia

Job Number: 360-11840-1

Method Blank - Batch: 360-22852

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-22852/1-A

Client: Olin Corporation

Analysis Batch: 360-22858

Client Matrix:

Water

Prep Batch: 360-22852

Instrument ID: No Equipment Assigned

Dilution:

1.0

Units: mg/L

Lab File ID: N/A

Initial Weight/Volume: mL

Date Analyzed: 09/04/2007 1323 Date Prepared: 09/04/2007 1127

Final Weight/Volume: 50 mL

Analyte

Ammonia

Result Qual ND

RL 0.10

RL 0.10

Lab Control Spike - Batch: 360-22852

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-22852/2-A

Client Matrix:

Water

Dilution: 1.0

Date Prepared: 09/04/2007 1127

Date Analyzed: 09/04/2007 1324

Analysis Batch: 360-22858

Prep Batch: 360-22852

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: 50 mL

Result % Rec. Limit Qual Spike Amount Analyte 96 / 85 - 115 10.0 9.64 Ammonia

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22852

Method: 10-107-06-1

Preparation: Distill/Ammonia

MS Lab Sample ID:

360-11840-6 Water

Analysis Batch: 360-22858

Client Matrix:

Prep Batch: 360-22852

Instrument ID: No Equipment Assigned

Dilution:

2.0

Initial Weight/Volume:

Lab File ID:

mL

Date Analyzed:

09/04/2007 1337

Final Weight/Volume: 50 mL

Date Prepared:

09/04/2007 1127

Instrument ID: No Equipment Assigned

MSD Lab Sample ID: 360-11840-6

Water

Analysis Batch: 360-22858 Prep Batch: 360-22852

N/A

Client Matrix:

Dilution:

2.0

Lab File ID:

Initial Weight/Volume: mL

Final Weight/Volume: 50 mL

Date Analyzed: 09/04/2007 1338 Date Prepared: 09/04/2007 1127

MSD

Limit

**RPD Limit** 

Analyte

MS

RPD

MS Qual MSD Qual

Ammonia

115 113

75 - 125

20

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22524

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22524/1

Client Matrix: Water

Dilution: 1.0 Date Analyzed: 08/23/2007 1255

Date Prepared: N/A

Analysis Batch: 360-22524

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: mL

Analyte	Result	Qual	RL	RL	
Sulfate	ND		2.0	2.0	
Chloride	ND		1.0	1.0	

Lab Control Spike - Batch: 360-22524

Lab Sample ID: LCS 360-22524/2

1.0

Date Analyzed: 08/23/2007 1310

Client Matrix: Water

Date Prepared: N/A

Dilution:

NO AND COLUMN TO LAR

Analysis Batch: 360-22524

Prep Batch: N/A

Units: mg/L

Method: 300.0 Preparation: N/A

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: mL

Analyte	Spike Amount	Result	% Rec.	Limit Qual
Sulfate	80.0	79.8	100	85 - 115
Chloride .	40.0	40.5	101	85 - 115

Client: Olin Corporation

Job Number: 360-11840-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22524

Method: 300.0 Preparation: N/A

MS Lab Sample ID:

360-11840-6

Analysis Batch: 360-22524

Client Matrix:

Water

Instrument ID: No Equipment Assigned

Dilution:

Lab File ID: N/A

Date Analyzed:

08/23/2007 1511

Prep Batch: N/A

Initial Weight/Volume: Final Weight/Volume: 10 mL

Date Prepared:

N/A

MSD Lab Sample ID: 360-11840-6

Analysis Batch: 360-22524

Instrument ID: No Equipment Assigned

Client Matrix:

Water

Dilution:

1.0

Prep Batch: N/A

Lab File ID: N/A

Date Analyzed: Date Prepared:

08/23/2007 1526 N/A

Initial Weight/Volume: mL Final Weight/Volume: 10 mL

% Rec. Analyte MS MSD Limit RPD RPD Limit MS Qual MSD Qual Sulfate 80 89 75 - 125 20

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22525

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22525/1

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/23/2007 1928

Date Prepared: N/A

Analysis Batch: 360-22525

Prep Batch: N/A Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte		Result	Qual	RL	RL	
Sulfate	+ M. N	ND	characteristics of the second	2.0	2.0	*
Chloride		ND /		1.0	1.0	

Lab Control Spike - Batch: 360-22525

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22525/2

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/23/2007 1943

Date Prepared: N/A

Analysis Batch: 360-22525

Prep Batch: N/A

Instrument ID: No Equipment Assigned Lab File ID: N/A

Initial Weight/Volume: mL Units: mg/L Final Weight/Volume:

% Rec. Limit Result

Qual Spike Amount Analyte 80.4 85 - 115 Sulfate 80.0 100 Chloride 40.0 40.9 102 85 - 115

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22529

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22529/1

Client Matrix: Water

Dilution: 1.0 Date Analyzed: 08/23/2007 1255

Date Prepared: N/A

Analysis Batch: 360-22529

Prep Batch: N/A

Units: ma/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume:

Final Weight/Volume: mL

Analyte Result Qual RL RL Nitrate as N 0.050 0.050 ND

Lab Control Spike - Batch: 360-22529

Preparation: N/A

Lab Sample ID: LCS 360-22529/2

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/23/2007 1310

Date Prepared: N/A

Analysis Batch: 360-22529

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Method: 300.0

Initial Weight/Volume: mL

Final Weight/Volume: mL

Analyte Spike Amount Result % Rec. Limit Qual Nitrate as N 4.00 4.07 102 85 - 115

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22529

Method: 300.0 Preparation: N/A

MS Lab Sample ID:

360-11840-6 Client Matrix:

Dilution:

Water

1.0

Date Analyzed:

08/23/2007 1511

Date Prepared:

N/A

Analysis Batch: 360-22529

Prep Batch: N/A

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-11840-6

Client Matrix:

Water

Dilution:

10

08/23/2007 1526

Date Analyzed: Date Prepared:

N/A

Analysis Batch: 360-22529

Prep Batch: N/A

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: 10 mL

Analyte MS MSD Limit RPD **RPD Limit** MS Qual MSD Qual Nitrate as N 116 119 75 - 125 20

Calculations are performed before rounding to avoid round-off errors in calculated results.

TestAmerica Westfield

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Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22530

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22530/1

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/23/2007 1928

Date Prepared: N/A

Analysis Batch: 360-22530

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: Final Weight/Volume: mL

Analyte Result Qual RL RL ND 0.050 Nitrate as N 0.050 Nitrite as N ND 0.010 0.010

Lab Control Spike - Batch: 360-22530

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22530/2

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/23/2007 1943

Date Prepared: N/A

Analysis Batch: 360-22530

Prep Batch: N/A Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume:

% Rec. Analyte Spike Amount Result Limit Qual Nitrate as N 85 - 115 4.00 4.16 104 Nitrite as N 4.00 4.11 103 85 - 115

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22569

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22569/1

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/24/2007 1558

Date Prepared: N/A

Analysis Batch: 360-22569

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume:

Analyte RL Result Qual RL 0.050 Nitrate as N ND 0.050 Nitrite as N ND 0.010 0.010

Lab Control Spike - Batch: 360-22569

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22569/2

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/24/2007 1613

Date Prepared: N/A

Analysis Batch: 360-22569

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume:

Analyte Spike Amount Result % Rec. Limit Qual Nitrate as N 4.00 4.12 103 85 - 115 Nitrite as N 4.00 4.11 103 85 - 115

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22570

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22570/1

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/24/2007 2231

Date Prepared: N/A

Analysis Batch: 360-22570

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume:

Final Weight/Volume: mL

RL RL Qual Analyte Result 0.010 0.010 Nitrite as N ND/

Lab Control Spike - Batch: 360-22570

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22570/2

Client Matrix: Water 1.0 Dilution:

Date Analyzed: 08/24/2007 2246

Date Prepared: N/A

Analysis Batch: 360-22570

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume:

Final Weight/Volume: mL

Qual % Rec. Limit Analyte Spike Amount Result Nitrite as N 4.00 4.15 104 85 - 115

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22570

Method: 300.0 Preparation: N/A

MS Lab Sample ID:

Client Matrix:

Date Analyzed:

Dilution:

360-11840-6

08/24/2007 2331

Water

20

Analysis Batch: 360-22570

Prep Batch: N/A

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: 10 mL

Date Prepared: N/A

MSD Lab Sample ID: 360-11840-6

Client Matrix:

Water

Dilution: 08/24/2007 2346 Date Analyzed:

Date Prepared:

N/A

Analysis Batch: 360-22570

Prep Batch: N/A

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: 10 mL

MSD Limit RPD **RPD Limit** MS Qual MSD Qual MS Analyte Н H 75 - 125 20 Nitrite as N 85 85

Calculations are performed before rounding to avoid round-off errors in calculated results.

**TestAmerica Westfield** 

Page 44 of 50

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22590

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22590/1

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/24/2007 1558

Date Prepared: N/A

Analysis Batch: 360-22590

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A Initial Weight/Volume:

Final Weight/Volume:

Analyte	Result	Qual	RL	RL	
Sulfate	ND /	Laboration of the second section of the	2.0	2.0	
Chloride	ND /		1.0	1.0	

Lab Control Spike - Batch: 360-22590

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22590/2

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/24/2007 1613

Analysis Batch: 360-22590

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: mL

Date Prepared: N/A

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	82.0	102	85 - 115	
Chloride	40.0	41.1	103	85 - 115	

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22591

Method: 300.0 Preparation: N/A

Lab Sample ID: MB 360-22591/1

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/24/2007 2231

Date Prepared: N/A

Analysis Batch: 360-22591

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: mL

Analyte	Result	Qual	RL	RL	
Sulfate	ND /		2.0	2.0	
Chloride	ND (		1.0	1.0	

Lab Control Spike - Batch: 360-22591

Method: 300.0 Preparation: N/A

Lab Sample ID: LCS 360-22591/2

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/24/2007 2246

Date Prepared: N/A

Analysis Batch: 360-22591

Prep Batch: N/A

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Sulfate	80.0	80.6	101	85 - 115	To an announce of the could be at the
Chloride	40.0	41.3	103	85 - 115	

Client: Olin Corporation

Job Number: 360-11840-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22591

Method: 300.0 Preparation: N/A

MS Lab Sample ID:

360-11840-6

Instrument ID: No Equipment Assigned

Client Matrix:

Water

Analysis Batch: 360-22591 Prep Batch: N/A

Lab File ID:

Dilution:

N/A

20

Initial Weight/Volume:

mL

Date Analyzed:

08/24/2007 2331

Final Weight/Volume:

10 mL

Date Prepared:

MSD Lab Sample ID: 360-11840-6

Analysis Batch: 360-22591

Instrument ID: No Equipment Assigned

Client Matrix:

Water

Dilution:

20

Prep Batch: N/A

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: 10 mL

Date Analyzed: Date Prepared:

08/24/2007 2346 N/A

% Rec.

Limit

**RPD** 

RPD Limit

Analyte

MS

MSD 108

20

MS Qual MSD Qual

Chloride

107

75 - 125

Client: Olin Corporation

Job Number: 360-11840-1

Method Blank - Batch: 360-22497

Method: SM 2510B Preparation: N/A

Lab Sample ID: MB 360-22497/7

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/23/2007 0849

Date Prepared: N/A

Analysis Batch: 360-22497

Prep Batch: N/A Units: umhos/cm Instrument ID: MAN-TECH Ion Plus

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte		Result	Qual RL		RL	
Specific Conductance	2 - 4 - 100 de 1	ND	Minne 1	1.0	1.0	ton th

Lab Control Spike - Batch: 360-22497

Method: SM 2510B Preparation: N/A

Lab Sample ID: LCS 360-22497/5

Client Matrix: Water Dilution: 1.0

Date Analyzed: 08/23/2007 0837

Date Prepared: N/A

Analysis Batch: 360-22497

Prep Batch: N/A Units: umhos/cm Instrument ID: MAN-TECH Ion Plus

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
Specific Conductance	1410	1430	101	85 - 115	

Duplicate - Batch: 360-22497

Method: SM 2510B Preparation: N/A

Lab Sample ID: 360-11840-6

Client Matrix: Water Dilution: 10

Date Analyzed: 08/23/2007 1051

Date Prepared: N/A

Analysis Batch: 360-22497

Prep Batch: N/A Units: umhos/cm Instrument ID: MAN-TECH Ion Plus Autoti

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
Specific Conductance	510	514	0 /	PERFORMANCE AND	

#### LOGIN SAMPLE RECEIPT CHECK LIST

Client: Olin Corporation

Job Number: 360-11840-1

Login Number: 11840

Question	T/F/NA	Comment
Radioactivity either was not measured or, if measured, is at or below background	NA	
The cooler's custody seal, if present, is intact.	NA	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	1.4 C
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the sample IDs on the containers and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	NA	
If necessary, staff have been informed of any short hold time or quick TAT needs	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	

#### Severn Trent Laboratories. Inc. Chain of Custody Form

SEVERN STT 43144

 53 Southampton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

•149 Rangeway Road N. Billerica, MA 01862 (P) 978-667-1400 (F) 978-667-7871

STL Billerica / Service Center

a surface waser

STL Westfield

Job#360- 11840 Quote# Project #: 63000600 PCMP Client: MACTEC Shaded areas for office use Address: 107 Audubon Rd Project Manager: Perer Thompson Comments Analysis Requested
Check analysis and specify method
and analytes in similarity section.
For example: 2
500-series for prinking water
600-series for prinking water
600-series for prophogater, soil, waste
8000-series for prophogater, soil, waste
Use comment Decroph Surther define. (Special Instructions) Suite 301, watefield, MA Work ID: Phone: (781) 245 - 660C 781/246 506 Contact: Dowe Chapman Please print legibility. If the analytical Regulatory Classification requests are not clearly defined on the Requested Turnaround Time (PLEASE SPECIFY) Special Report Format chain-of-custody, the turnarcy nd time NPDES \_\_\_\_ Drinking Water\_\_\_\_ QA/QC Report STANDARD X RUSH - MCP GW1/S1 --- DQE (MCP) Rpt will begin after all questions have been RCRA --satisfactorily answered. (Lab Approval Required) DEP Form(s) Other -Sample Type Codes Preservative Volatiles 524 /624 /8260 WW-Wastewater DW-Drinking water SW-Surface water LW-Lab water GW-Groundwater A-Air Plastic(P) or Glass(G) NaOH to pH >12 Na2S2O3 S-Solid / Soll SL-Studge O-Oil Z-Other Date Metal 6010 HNO3 to pH < Time Collected Sample ID 8/22/07 1500 - 3 THA 5:50 8/22/07 1500 - 2 9:05 8/22/07 PZ - 16 RSW 9:54 8/22/67 10:30 5 22 C Remove Per 8/22/07 IBCO - 1 11:00 5 22 07 ISCC-L DUP 11:00 8/22/07 ESCO-1 MS 11:00 8/22/07 ISCO - 1 MSD 11:00 8/22/07 PZ - 17 RR to i to MADEP Requirement Sampled by (print): Signature: Cooler ? ( N Samples leed? (V) / N Dave Chapman Hanlon Relinquished by: Received by: Dave Cheaman Temp @ receipt: Received by Relinquished by: Preservation / pH checked? (V) N Relinquished by: Received by: By: 1400 Date: 8/22/0

Version 1.2, Nov 2002

## OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Reviewer/Da	te	6/1	6	Mila	les	"	//3	16
Sr. Review/D		Chr	3	RILLAN	di	11	27	107
Lab Report	#:	360-1	18	40-1				
Project # 6	30	00600	1/.	6111			100	

total	and dissolut aleminen chronium sodiem.
1.0	Laboratory Deliverable Requirements
	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes No NA Comments:
	☐ Name of Laboratory ☐ Address ☐ Project ID ☐ Phone # ☐ Sample identification — Field and Laboratory  Client Information: ☐ Name ☐ Address ☐ Client Contact (IDs must be cross-referenced)
	Client Information:
ACTIO	ON: If no, contact lab for submission of missing or illegible information.  1.2 Laboratory Report Certification Statement  Yes [ No [ N/A [ ] Comments:
Does the	ne laboratory report include a completed Analytical Report Certification in the required format?
ACTION	N: If no, contact lab for submission of missing certification or certification with correct format.
	1.3 Laboratory Case Narrative: Yes [ ] No [ ] N/A [ ] Comments:
	Narrative serves as an exception report for the project and method QA/QC performance. Narrative includes an explanation of each discrepancy on the
	Certification Statement.
ACTION	N: If no, contact lab for submission of missing or illegible information.
	1.4 Chain of Custody (COC) copy present with all documentation completed  Yes No NA Comments:
1	NOTE: Olin receives and maintains the original COC.

ACTION: If no, contact lab for submission of copy of completed COC.

# OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

													/			-	
	1.5 Sa	mple I	Receip	t Infor	nation (	Cooler	Receip	t Forn	ı presen	t?):		Yes 🗾	No [_]	N/A [_]	Comments:		
/	Were e			ollowing	tasks c	omplete	d and re	corded	upon rec	ceipt of the	sample(s)						
			/				/				/	-			ature requireme	ent does not	apply).
☐ Conta	ainer type	e noted	d 🗹 sa	mple co	ndition	observed	і <b>Д</b> рН	verifie	d (where	applicable)	Field a	nd lab IDs c	ross referen	ced			
ACTIO	N: If no	, conta	act lab	for subn	nission o	f missin	g or inco	mplete	documen	tation.		7					
												/					
	1.	.5.1	Were	all sam	ples deli	vered to	the labo	ratory v	vithout b	eakage?	*	Yes 🗾	No [_]	N/A [_]	Comments:		
	1.	5.2	with s	ample i	eceipt, c	ondition	m or La of the sa ality of t	amples,	analytica	licate other pal problems of	problems or special	Yes [_]	No 🗸	N/A [_]	Comments:		**
	1.6 Sa	mple 1 oratory	Result y repor	s Section	on: Was h sampl	each o	of the fo	llowing	requirem	ents supplie	ed in the	Yes 🗾	No [_]	N/A 📋	Comments:		*
Afield Clear Matri	n-up met	l Lab II thod	D	☑ L ☑ A ☑ Targ	Date and malysis i et analy	time co method tes and c	llected	tions	A Arti	yst Initials eparation me	ethod D Uni	Dilution Dale of pits (soils mus	Factor preparation/ t be reporte	extraction/dig d in dry weigh	moisture or sol estion clean-up ut)	ids and analys	Reporting limitis, where applicable
ACTIO	N: If no	, conta	ect lab	for subn	nission o	f missin	g or inco	mplete	informati	on.			,				
	1.7 QA laborato						the follo	owing	informati	on supplied	1 in the	Yes 🗾	No [_]	N/A [_]	Comments:		

6010

## OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200 7

/ /_	A CI METALS BY METHOD 0010B/200.7
Method blank results DLCS	recoveries MS/MSD recoveries and RPDs Laboratory duplicate results (where applicable)
ACTION: If no, contact lab for sul	omission of missing or incomplete information.
2.0 Holding Times	
	determined from date of collection to date of analysis, been Yes [ ] No [ N/A ] Comments: or metals is 180 days from sample collection to analysis for both
NOTE: List samples that exceed ho	d time with # of days exceeded on checklist
	es are exceeded, qualify all positive results (J) and non-detects 2X holding time) reject (R) all non-detect results.
3.1 Was the correct	laboratory method used?  Yes No N/A Comments:
Water Digestion Soil Digestion Metals	3005A or 3010A or 3020A 3050B 6010B or 200.7
	boratory to provide justification for method change thod. Contact senior chemist to inform Client of change
	QAPP  Lab  MADEP
NOTE: Verify that the reported m	etals match the target list specified on the COC.

# OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

	: If no, evaluate variation with respect to sample matrix, preparation, dilution, etc. If sample PQL is indeterminate, contact lab for explanation.				
3.3	Are results present for each sample in the SDG?	Yes 🗸	No [_]	N/A [_]	Comments:
ACTION: If	no, check Request for Analysis to verify if method was ordered and COC to verify that i	t was sent, ar	nd contact la	b for resubmi	ssion of the missing data
3.4	If dilutions were required, were dilution factors reported?	Yes 🗾	No [_]	N/A [_]	Comments:
ACTION: If	no, contact the lab for submission.		¥		
4.0 <u>Met</u>	hod Blanks				9
4.1	Is the Method Blank Summary present?	Yes [	No 🔝	N/A [_]	Comments:
ACTION:	If no, call the laboratory for submission of missing data.		5\$*?		
4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes 🗾	No [_]	N/A [_]	Comments:
	If no, contact laboratory for justification. Consult senior chemist for action arrate non-compliance.				
4.3	Is the method blank less than the PQLs for all target elements?	Yes /	No[]	N/A[_]	Comments:
NOTE: M/ samples	ADEP requires the method blank to be matrix matched and digested with the		5	,	×
4.4 the fo	Do any method blanks have positive results for metals? Qualify data according to sllowing:	Yes [_]	No 🔝	N/A [_]	Comments:

# OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

ACTION: For any blank with positive results, list all contaminants for each method blank including the concentration detected and the flagging level (flagging level = 5x the blank value) and the associated samples and qualifiers.

5.0 Labo	oratory Control Standard				
5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes 🔝	No [_]	N/A [_]	Comments:
ACTION:	target, second source LCS is required by MADEP.  Call laboratory for LCS form submittal. If data are not available, use ljudgement to evaluate data accuracy associated with that batch.	,	/		
5.2	Is a LCS Summary Form present?	Yes [	No [_]	N/A [_]	Comments:
ACTION:	If no, contact lab for resubmission of missing data.			,	
5.3	Is the recovery of any analyte outside of MADEP control limits?  MADEP	Yes [_]	No 📝	N/A [_]	Comments:
Samp Water	le Type	72			
Soil	within Lab generated limits				
within the b	If recovery is above the upper limit, qualify all positive sample results patch as (J). If recovery is below the lower limit, qualify all positive and results within the batch as (J). If LCS recovery is <30%, positive and non-	3		ž	
detect result	s are rejected (R).				

6010

Comments:

#### OLIN CORPORATION

#### LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

ISCO-1

Comments:

Comments:

No [ ] N/A [ ] Comments:

N/A

#### 6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

NOTE: A full target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

	MADEP	QAPP	
Sample Type	% Rec	% Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE:  $%R = (SSR-SR) \times 100\%$ SA

Where: SSR = Spiked sample result SR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

## OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags. ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J). Are any RPDs for MS/MSD recoveries outside of the QC limits? 6.5 Where: S = MS sample result NOTE:  $RPD = S-D \times 100\%$ (S+D)/2D = MSD sample result NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied. ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J). **Laboratory Duplicate** 7.0 7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [ Duplicate Sample Form present? NOTE: MADEP refers to this sample as a "matrix duplicate". ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance. 7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the OA/OC limits?

### OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

MADEP Laboratory Duplicate Sample RPD Criteria:	<b>QAPP RPD</b>
For aqueous results > 5× RL, RPD must be ± 20%	20
For aqueous results < 5×RL, RPD must be ≤RL	20
For soil/sediment results > 5× RL, RPD must be ±35%	20
For soil/sediment results < 5x RL, RPD must be ≤ 2x RL	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

#### 8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- 8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
- 8.2 Do any rinsate blanks have positive results?

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

#### 9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.

Yes No No NA Comments:

Samples ISCO-I and ISCO-I

6010

## OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION - OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

	9.2 Were field duplicates collected per the required frequency?	Yes Lul	No ∐	N/A [_]	Comments:	
	SOW QAPP (1 per 10) MADEP Option 1 (1 per 20) MADEP Option 3 (1 per 10)	1				
	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes 🗹	No [_]	N/A [_]	Comments:	See attacked.
A	CTION: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results	if the RPD	exceeds 50	%.		
10	0.0 Special QA/QC					

10.1 Were both total and dissolved metals analysis performed? If so, the dissolved metal concentration should not exceed that of the total metal.

ACTION: If results for both total and dissolved are  $\geq 5x$  the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

Yes No [ N/A [ Comments:

The dissolved codium in samples ISCO-3
PZ-16 RSW, SP-17, ISCO-1,

ISCO-I-DUP, is greater than 102
of the total bad persto. Lead
result in the samples was
qualified estimated (J).

SAMPLE ID	ANALYTE	ORIG	DUP	RPD	
ISCO-1	total Aluminum	94	100	6	
ISCO-1	total Chromium	13	13	0	
ISCO-1	total Sodium	46000	43000	7	
ISCO-1	dissolved Aluminum	7.2	8.6	18	
ISCO-1	dissolved Chromium	3.4	3.6	6	
ISCO-1	dissolved Sodium	51000	51000	0	

# OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

10.0	Application of Validation Qualifiers						546
	Was any of the data qualified?	*	9	Yes 🗹	No 📋	N/A [_]	Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

#### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

Version 2, April 2003

### OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST WET CHEMISTRY PARAMETERS BY VARIOUS METHODS

Reviewer/Date	1	11/1	Mellet	11/15/19
Sr. Review/Date		Chris		111270
Lab Report #	360	-11940	-/	1 1
Project # 63	0006	011.41.	1	

immonia, sulfate, nitrate, nitrite, chloride gree conductive.

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

	not do mai di notati, que e e e e e e e e e e e e e e e e e e		
1.0	Laboratory Deliverable Requirements		*
	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Check items received.		Comments:
	☐ Name of Laboratory ☐ Address ☐ Project ID ☐ Phone #  Client Information: ☐ Name ☐ Address ☐ Client Contact	Sample identification – Field and La	aboratory
	Client Information:	(IDs must be cross-referenced)	
ACTI	ON: If no, contact lab for submission of missing or illegible information.		
	1.2 Laboratory Report Certification Statement	Yes No NA NA	Comments:
	Does the laboratory report include a completed Analytical Report Certification in the	required format?	
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct	format.	
	1.3 Laboratory Case Narrative:	Yes [ No [ N/A []	Comments:
	Narrative serves as an exception report for the project and method QA/QC performance	e. 🗹 Narrative includes an explanati	on of each discrepancy on the
		Certification Statement.	
ACTIO	N: If no, contact lab for submission of missing or illegible information.		
	1.4 Chain of Custody (COC) copy present with all documentation completed?	Yes No N/A	Comments:
	Does the laboratory report include copies of Chain of Custody forms containing all samples	in this SDG?	
	NOTE: Olin receives and maintains the original COC.		
ACTIC	IN: If no contact lab for submission of conv of missing completed COC		

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following tasks completed and recorded upon receipt of the sample(s) into the laboratory?

и	Yes 🔝	No [_]	N/A []	Comments:			
Sample temperature confirmed: must be 1° – 10° C. (If samples were sent by courier and delivered on the same day as collection, temperature requirement does not apply).							
☐ Container type noted ☐ Condition observed ☐ pH verified (where applicable) ☐ Field and lab II	Os cross refer	renced					
ACTION: If no, contact lab for submission of missing or incomplete documentation.							
1.5.1 Were the correct bottles and preservatives used?	/	/		_			
✓Ammonia, - 1 Liter polyethylene/H₂SO₄ to pH<2,cool to 4°C	Yes 🗾	No []	N/A []	Comments:	8		
Oil & Grease - 1 Liter glass/HCL to pH<2,cool to 4°C							
Alkalinity – 1 Liter polyethylene/cool to 4°C	l,						
Chemical Oxygen Demand - 50 mL polyethylene/H2SO4 to pH<2,cool to 4°C							
Chloride, pH, sulfate - 50 mL polyethylene/cool to 4°C							
Organic Carbon - 500 mL amber glass bottle/HCl or H2SO4 to pH<2,cool to 4°C							
Sulfide – 50 mL polyethylene/ZnAcetate + NaOH to pH>9, cool to 4°C Specific conductance, TDS, TSS – 100 mL polyethylene/cool to 4°C				i K			
ACTION: If no, inform senior chemist. Document justification for change in container/volume (if applicable), qualify positive and non-detect data (J) data if cooler temperature exceeds 10°C. Rejection of data requires professional judgment	/	/					
1.5.2 Were all samples delivered to the laboratory without breakage?	Yes [_]	No [_]	N/A [_]	Comments:			
1.5.3 Does the Cooler Receipt Form or Lab Narrative indicate other problems with sample receipt, condition of the samples, analytical problems or special circumstances affecting the quality of the data?	Yes [_]	No [_]	N/A [_]	Comments:			

### OLIN-WILMINGTON

]	LEVEL I DATA QUALITY EVALUATION
STANDA	RD OPERATING PROCEDURE AND CHECKLIST
WET CHE	MISTRY PARAMETERS BY VARIOUS METHODS

	Sample Results Section: Was to eport for each sample?	he following information supplied in the	Yes No No	N/A [_] Comments:	
☑ /Field ID at ☐ Glean-up m	nd Lab ID	ne collected Analyst Initials	Dilution Factor Date of preparation/extraction	1 % moisture or solids  /digestion clean-up and analysis, w	Reporting limit
☐ Matrix	☐ Target analytes	and concentrations	Units (soils must be reported	in dry weight)	
ACTION: If	no, contact lab for submission of	nissing or incomplete information.			
1.7 Q for ea	A/QC Information: Was the fol ch sample batch?	lowing information provided in the labor	ratory report Yes I No [	N/A [] Comments:	
	/				
☐ Method bla	nk results	✓ MS/MSD recoveries and RPDs ✓	Laboratory duplicate results (where	applicable)	
ACTION: If r	no, contact lab for submission of r	nissing or incomplete information.			
2.0 <u>Holdi</u>	ing Times		Yes No [.]	N/A Comments:	
Have	any technical holding times, det	ermined from date of collection to date of	of analysis, been exceeded? The hol	ding times are as follows:	
/		ygen demand, chloride, organic carbon			2
	Alkalinity = 14 days	Sulfide, TDS, TSS = 7 days	pH = analyze immediately	Nitrate nitrogen as N = 48	hrs
	Nitrite nitrogen as N = 48 hrs	Nitrate + Nitrite as N = 28 days			
		ime with # of days exceeded on checklis	t	#	
ACTION: If		eded qualify results (J). For water samp	ples that are grossly exceeded (>2X		ct results. Professional
3.0	Laboratory Method		Yes No No	N/A [_] Comments:	
	as the correct laboratory method		tod wathod Contact comics about	nist to inform Client of change or to	request variance
ACTION: If n	o, contact lab to provide justificat	ion for method change compared to the r	equested incurou. Contact semoi chei	mor to inform Chem of change of te	. request turianes.

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	3.2 Are the practical quantitation li ☐ SOW ☐ QAPP ☐ Lab	mits the same as those specified by o?	the Yes No No N/A	Comments:		
	Note: The MADEP QA/QC Guidelines do therefore all criteria will default to values stip define criteria, QA/QC requirements defaul may also apply.	nulated in the QAPP*. Where the QAPP does	s not			
		Alkalinity** $\square = 1 \text{ mg/L}$	Bicarbonate Alkalinity** □ = 1 mg/L	Carbonate Alkalinity** □ = 1 mg/L		
	Nitrate Nitrogen as N* ☑ = .05 mg/L	Nitrite Nitrogen as N* ☐ = .01 mg/L	Chloride* □ = 1 mg/L	Hardness $*\Box = 2 \text{ mg/L}$		
	Spec. Cond.** 2 3 umhos/cm	Total Organic Carbon** □ = 1 mg/L	Oil & Grease* $\square$ = 3 mg/L	Sulfate (EPA 300.0)* = 2 mg/L		
	COD:* Low – 20 mg/L	COD* High - 50 mg/L □	$TDS* \square = 10 \text{ mg/L}$	TSS* $\square = 5 \text{ mg/L}$		
	pH* □ < 2 to > 12					
	Other parameter(list)	_PQL =	irce of PQL =			
	Other parameter(list)	_ PQL =	irce of PQL =			
ACTIO	N: If no, evaluate change with respect to sam	pple matrix, preparation, dilution, moisture, e	etc. If sample PQL is indeterminate, contact la	ab for explanation.		
	3.3 Are the appropriate parameter results pro	esent for each sample in the SDG?	Yes No No N/A	Comments:		
ACTIO	N: If no, check Request for Analysis to verify	y if method was ordered and COC to verify the	hat it was sent, and contact lab for resubmissi	on of the missing data		
	3.4 If dilutions were required, were dilution f	factors reported?	Yes No No N/A	Comments:		
ACTIO	N: If no, contact the lab for submission.					
4.0	Method Blanks		Yes No No N/A	Comments:		
4.1 Are the Method Blank Summaries present?						
ACTIO	N: If no, call the laboratory for submission o	f missing data.				
	4.2 Was a method blank analyzed for each a 20 or less?	analysis batch of wet chemistry field sample:	Yes No No N/A	Comments:		
			*			

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ACTIO	ON: If no,	document discrepancy in case narrative and contact lab for justification. Consult seni	or chemist fo	or action nee	ded.	
	4.3 Is th	ne method blank less than the PQL? (See Section 3.2 for PQLs).	Yes 🗹	No [_]	N/A [_]	Comments:
		any method blanks have positive results for wet chemistry parameters? Qualify data ng to the following:	Yes []	No [_]	N/A [_]	Comments:
		imple concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the the concentration reported if greater than the PQL.				
	If the sa	mple concentration is $> 5 \times$ blank value, no qualification is needed.				
ACTI qualific		ny blank has positive results, list all the concentrations detected and flagging level (fla	gging level	= 5 × blank v	value) on the o	checklist. List all affected samples and the
5.0	<u>Labora</u>	tory Control Standards	/	/		
	5.1	Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?	Yes 🔟	No [_]	N/A [_]	Comments:
		o, call laboratory for LCS form submittal. If data is not available, use professional rmine qualification actions for data associated with the batch.				
	5.2	Is a LCS Summary Form present?	Yes 🗾	No [_]	N/A [_]	Comments:
ACTIO	ON: If no,	contact lab for resubmission of missing data.		,		
	5.3	Is any wet chemistry analyte LCS recovery outside the control limits?	Yes []	No 🕍	N/A [_]	Comments:

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	imits:			
	Alkalinity** □ = 80-120%  Total Organic Carbon** □ = 80-120%  COD Low* □ = 80-120%  Hardness* □ = 85-115%	Bicarbonate Alkalinity** □ = 80-120%  TDS** □ = 80-120%  COD High* □ = 80-120%  Chloride* □ = 80-120%	Carbonate Alkalinity** □ = 80-120%  Oil & Grease* □ = 80-120%  Nitrate Nitrogen as N** □ = 85-115%  Sulfate (EPA 300.0)* □ = 75-125%	Specific Conductivity *□ = 80-120%  Ammonia Nitrogen as N* □ = 80-120%  Nitrite Nitrogen as N** □ = 75-120%  pH* □ = 98-102%  TSS* NA
	Other parameter(list)	%R =	☐ Rec Limits=	
	Other parameter(list)	%R =	Rec Limits =	
	ON: If recovery is above the upper limit, the batch as (J). If LCS recovery is <10%,		e batch as (J). If recovery is below the lower li	mit, qualify all positive and no-detect results
6.0	Matrix Spikes			
Matrix	spikes may be collected at different f	requencies based on monthly, quarterly ents for each set with the senior chemist		

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6.3	Were matrix spikes analyzed at matrix?	the required frequency of 1 per 20 sa	mples per Yes No No	N/A [_] Comments:
ACTION: If an	ny matrix spike data is missing, call	lab for resubmission.		
6.4	Are any wet chemistry analyte sp	ike recoveries outside of the QC limits?	Yes [_] No [_]	N/A [_] Comments:
	NOTE: %R = (S	SR-SR) x 100%	Whe	ere: SSR = Spiked sample resu SR = Sample resu
		SA = Spike added		
MS/M	ISD Recovery Limits:			
Alkali	inity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHAT) ☐ 74-125%
Chlorie	inity* = NA ide*(SM 4500 Cl) 🗹= 77-116%	Specific Conductivity * = NA	Total Organic Carbon* = NA	$TDS^{**} = NA$
Oil &	Grease* = NA	COD Low* □ = 61-142%	COD High* □ = 92-109%	Nitrate Nitrogen as N** 🕒 = 75-119%
Nitrite	Grease* = NA Nitrogen as N** 🗵 = 68-136%	Hardness* □ = 70-130%	Sulfate (EPA 300.0)* □ = 75-125	
	parameter(list)	% R =	□ Rec Li	imits =
* = La	boratory Limits **=	Olin QAPP Limits (MADEP has no	t yet defined LCS recovery limits fo	or wet chemistry analyses.)
NOTE		for an MS/MSD pair is outside of the co d by the laboratory on a non-project san		ry. Use professional judgment for the MS/MSD flags.
qualify positive	results as estimated (J). If the reco	e spiked. Do not evaluate if sample converies of the MS and MSD are lower the detect, the results are considered unusable.	nan the lower control limit but > 30%	ries of the MS and MSD exceed the upper control limi, qualify both positive results and non-detects (J). If the
	poratory control limits apply when s no flags are applied.	piked sample results fall within the nor	mal calibration range. If dilutions are	required due to high sample concentrations, the data i
6.5 Ar	e any RPDs for MS/MSD recoveries	s outside of the QA/QC limits?	/	
NOTE	E: RPD = $\frac{S - D}{(S + D)/2}$ x 100% WI	nere S = MS result D = MSD result	Yes No No	N/A [_] Comments:

	MS/MSD RPD Limits:  Alkalinity* = NA  Chloride**(SM 4500 Cl) $\square$ = 15%  COD Low** $\square$ = 14%	Bicarbonate Alkalinity* = NA  Specific Conductivity * = NA  COD High** □ = 16%	Carbonate alkalinity*  Total Organic Carbon'  Nitrate Nitrogen as N	* = NA ** 🖳 16%		CHAT) □ = 8%  otal Organic Carbon* = 16%	= NA
	Oil & Grease* = NA	Hardness* = NA	Sulfate (EPA 300.0)*	= 10%	$pH^* = NA$	TSS* = NA	
	Other parameter(list)		RPD =	D R	PD limit =	E CONTROL CONT	
	Other parameter(list)		RPD =	D F	PD limit =		
	* = Laboratory Limits	** = Olin QAPP Limits					
	(MADEP has not yet defined LCS	recovery limits for wet chemistry	analyses.)				
7.0	<b>Laboratory Duplicate</b>			/			
	Are the RPDs for the laboratory dup	plicates <20% unless otherwise spec	cified below? Yes	No ∐	N/A []	Comments:	
ACTIO	N: If the RPD is greater than specifie	d limits, qualify all results for that an	alyte as estimated (J).				
	Alkalinity* = 4% Bicard	bonate Alkalinity* = 4%	Carbonate alkalinity* = 49	%	Oil & Grease* I	□ = 20%	
	pH* □ = 3% Speci	ific Conductivity *12 = 5%	TSS** □ = 6%		$TDS^{**} \square = 6\%$	ó	
8.0	Sampling Accuracy						
	ajority of ground water samples are edicated tubing. Rinse blanks will	[20]	process stream, or	-	/		
	8.1 Were rinsate blanks collected? associated samples from the senior control of the sen		obtain a list of the Yes		N/A []	Comments:	
	8.2 Do any rinsate blanks have positi	ive results?	Yes		N/A	Comments:	

ACTIO	ON: Evaluate rinsate results vs. blank results to determine if contaminant may be labor			174 HOUSE	BA BB SAFETY	to the table below.
	If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect "U" at the PQL	or the conc	entration repo	orted if greate	r than the PQL.	
	If the sample concentration is $> 5 \times$ blank value, no qualification is needed.					
NOTE:	MADEP does not require the collection of rinsate blanks.					
9.0	Field Duplicates	,			*	
	9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.	Yes 🗾	No []	N/A []	Comments:	20 E
		IS	co-1	and	Isco-7	DUP
	9.2 Were field duplicates collected per the required frequency?	Yes [	No [_]	N/A []	Comments:	
SOV	V □ QAPP □ MADEP Option 1(1 per 20) □ MADEP Option 3 (1 per 10) □					- ////
	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all results and attach to this review.	Yes 🔝	No [_]	N/A [_]	Comments:	See atheby
ACTIO	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results if	the RPD e	xceeds 50%			
	Was any of the data qualified?	Yes []	No 🗾	N/A 📋	Comments:	
	If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.					

SAMPLE ID	ANALYTE	ORIG	<b>DUP</b>	RPD
ISCO-1	Sulfate	76	75	1
ISCO-1	Chloride	78	76	3
ISCO-1	Ammonia	14	15	7
ISCO-1	Specific Conductance	510	520	2
ISCO-1	Nitrite	0.1	0.1	0
ISCO-1	Nitrate	0.93	0.93	0

#### REFERENCES

LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999.

STL-Westfield, 2002. "Olin - General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

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Engineering and Consulting, Inc.

511 Congress Street P.O. Box 7050 Portland, Maine 04112-7050 Telephone: 207/775-5401

Fax: 207/772-4762 Home Page: www.mactec.com

To: Steve Morrow From: Chris Ricardi Date: 11/20/07

Subject: 51 Eames St Property Plant B August 2007

#### Data Validation Summary TestAmerica Laboratories Data Set 360-11839

This sample set contained results for water samples identified as GW16 and GW16 DUP collected during monitoring completed in August - 2007. The samples were analyzed by TestAmerica (formerly Severn Trent Laboratories) for the following constituents:

#### Samples 'GW16' and 'GW16 DUP'

 volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), volatile petroleum hydrocarbons (VPH), dissolved metals (iron), and general chemistry analysis for ammonia, and pH (TestAmerica, Westfield, Massachusetts).

The Olin Wilmington Quality Assurance Project Plan 1999 (QAPP) was used as a reference during the review. Analytical packages were reviewed using the Level 1 Data Quality Evaluation checklists that were developed for the Olin Wilmington annual and quarterly groundwater monitoring tasks.

#### Validation Actions and Observations

Bis(2-ethylhexyl) phthalate is reported in the SVOC method blank. An action limit was established at ten times the reported blank concentration. The result for bis(2-ethylhexyl) phthalate in sample GW16 (360-11839-1) and GW16 DUP (360-11839-2) is less than the action limit and was qualified non-detect (U) at the reporting limit.

The SVOC matrix spike duplicate (MSD) percent recovery for n-nitrosodiphenylamine (-20) is less than the lower quality control (QC) limit and less than 10. A recovery of 88 percent was reported in the associated matrix spike (MS). The relative percent difference (RPD) for n-nitrosodiphenylamine (22) exceeds the QC limit of 20. The result for n-nitrosodiphenylamine in samples GW16 (360-11839-1) and GW16 DUP (360-11839-2) were qualified estimated (J).

The VOC matrix spike (MS) percent recovery for 2,4,4,-trimethyl-1-pentene (65) is less than the lower QC limit of 70. The RPD for 2,4,4,-trimethyl-1-pentene (32) exceeds the QC limit of 30. The result for 2,4,4,-trimethyl-1-pentene in samples GW16 (360-11839-1) and GW16 DUP (360-11839-2) was qualified estimated (J).

Samples for pH were received by the lab one day after sample collection. The laboratory analyzed pH two days beyond technical hold time. The results for pH were qualified estimated (J).

Unless noted above, the remainder of the results is interpreted to be usable as reported by TestAmerica.

Senior Chemist: Chris Ricardi, NRCC-EAC

Date: 11/20/07

Senior Principal Scientist: Michael J. Murphy

Date: 11/20/07



#### Ricardi, Christian

From: Wickham, Jamie [Jamie.Wickham@testamericainc.com]

Sent: Tuesday, November 13, 2007 12:26 PM

To: Ricardi, Christian
Cc: Mason, Becky

Subject: RE: Olin Set 360-11839-1

Hi Chris,

The recovery for NDPA is not being reporting correctly due to an association issue within the analytical batch. Unfortunately, it's not something I can fix in our LIMS system. Sample 11893-1 was analyzed at a 1X and 10X dilution. Bis(2EHP) was reported from the 1X and NDPA from the 10X. The MS/MSD was analyzed at a 1X and is associated (linked) with the 1X sample dilution; hence the funny recoveries for NDPA.

I've cut & pasted the pertinent information for NDPA below. If we take into account the volumes extracted and use the rounded results provided, the MS should be reported as -1030%R and the MSD as -1137%R. The "4" qualifier would still apply.

What might have been done to correct this is run the sample, MS & MSD all at the same dilution for NDPA. It would still yield negative recoveries, but at least we could have got the results to calculate correctly.

We could probably report this data on a CLP form if you're looking for a revised report...

#### 360-11893-1 (10X)

Analyte	Result	Units	Final	Final Unit	RL	MDL
N-Nitrosodiphenylamine	15.32805	ug/mL	160	ug/L	52	2.2

#### MS

Analyte	Result	Res Unit	Res	Final Unit	F/Q	Orig Res	Spike Amt	% F
N-Nitrosodiphenylamine	55.42907	ug/mL	56.0	ug/L	4	47.1	10.1	88

#### MSD:

		31 V	
N-Nitrosodiphenylamine	44.63082 ug/mL	10 46 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	47.1 10.1 -20

Jamie

From: Ricardi, Christian [mailto:CSRicardi@mactec.com]

Sent: Tuesday, November 13, 2007 11:10 AM

To: Wickham, Jamie Cc: Mason, Becky

Subject: Olin Set 360-11839-1

Hi Jamie,

We are reviewing data set 11839 and have a question. The MSD recovery for NDPA in the SVOC run is reported at -20%. The summary forms no longer provide the spike concentration. I would like to see that for my interpretation of the QC result. Can you check to make sure that the recovery is being reported correctly, and if so, can you send me the spike concentration? Thanks.

Chris Ricardi, NRCC-EAC
Senior Environmental Scientist
MACTEC Engineering and Consulting
511 Congress Street/PO Box 7050
Portland, Maine 04112-7050
207 775-5401 X3694
Fax 207 772-4762

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#### ANALYTICAL REPORT

Job Number: 360-11839-1

Job Description: Plant B Quarterly 6300060010

For:
Olin Corporation
1186 Lower River Road
Charleston, TN 37310-0248

Attention: Mr. Steven Morrow

Designee for

Joseph a. Clian J.

Becky C Mason

Project Manager II

becky.mason@testamericainc.com

09/05/2007

The test results in this report meet all NELAP requirements for accredited parameters. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced except in full, and with written approval from the laboratory. TestAmerica Westfield Certifications and Approvals: MADEP MA014, RIDOH57, CTDPH 0494, VT DECWSD, NH DES 253903-A, NELAP FL E87912 TOX, NELAP NJ MA008 TOX, NELAP NY 10843, NY DOH 10843.



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	MADE	P MCP Analytical Met	thod Repo	rt Certifica	tion Fo	orm
Laborato	ry Name:	TestAmerica Westfield		Proje	ect#:	360-11839-1
Project L	ocation:	T - 42 MH		MADEP R	TN1:	
This form 360-1183		cations for the following data set	:[list Laboratory	Sample ID Num	iber(s)]	
Sample N	Matrices:	Groundwater Soil/Se	diment	Drinking Water	Oth	er:
MCP SV	V-846	8260B(x) 8151A()	8330 ( )	6010B ( )	7470A/1A	( ) Other ( )
Method	s Used	8270C() 8081A()	VPH()		9014M <sup>2</sup> /9	9012()
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F	Were results t method(s) rep	for all analyte-list compounds/eleorted?	ements for the	specified		Yes N/A N
**	<sup>1</sup> All Negative re	sponses must be addressed in	an attached En	vironmental Labo	oratory ca	se narrative.
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analytic	ar report is, to ti	te best of my knowledge and	beller, accurat	e and complete	•	i i way
	Signature:	2 Astina		Position:	Laborate	ory Director
CAUSING		Steven C. Hartmann		_ Date:	9.5	5·07
CAM VII A, He	v 3:2	The state of the s		14 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Yes Yes	
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	MADE	P MCP Ana	alytical Me	thod Repo	rt Certifica	tion F	orm		
Laboratory	Name:	TestAmeric	a Westfield		Proj	ect#:	360-11	839-	ja .
Project Loc	cation:				MADEP F	RTN1:			
	provides certific	ations for the fo	llowing data se	t:[list Laborator)	/ Sample ID Nun	nber(s)]	12/4		
Sample Ma	atrices:	Groundwater	Soil/S	ediment	Drinking Wate	r Oth	ner:		
MCP SW	846	8260B( )	8151A()	8330()	6010B()	7470A/1A	1()	Other (	)
Methods	Úsed	8270C( )	8081A()	VPH(x)	6020 ( )	9014M <sup>2</sup> /	9012()		
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D				or EPH Method respective Method	d conducted with hods)?	out	Yes	N/A	No <sup>1</sup>
	A response	to questions E	and F below	is required for	"Presumptive	Certainty	" status		
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F	Were results f method(s) rep	The state of the s	t compounds/e	lements for the	specified	11	Yes	N/A	No <sup>1</sup>
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	Signature:	Str	Heat		_ Position:	Laborat	tory Direc	tor	
CAM VII A, Rev 3.		Steven C. Ha	rtmann		_ Date:	9.4	5.07	April-04	
**************************************		MADEP MA014	NELAP FL E87912 TO)		TestAmerica Westfield		Boston Service		$\neg$
TestA	merica	NY DOH 10843 RI DOH 57	NELAP NJ MAGOS TOX NELAP NY 10843 NH DES 253901-A		53 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707		148 Rangewa N.Billerica, M. Tel:(978)667- Fax:(978)667-	y Rd A 01862 1400	

			alytical Me	arou riopo	Tt Gortingt		-	414 204	
Laboratory	Name:	TestAmeric	a Westfield			ect#:	360	-11839	-1
Project Loc	cation:		. 74		MADEP I	RTN <sup>1</sup> :			
This form p 360-11839		ations for the fo	ollowing data se	t:[tist Laboratory	Sample ID Nur	nber(s)]			
Sample Ma	atrices:	Groundwater	Soil/Se	ediment	Drinking Water	r Ot	her:		
MCP SW-	846	8260B( )	8151A()	8330 ( )	6010B()	7470A/1	A()	Other	()
Methods	Used	8270C(x)	8081A()	VPH()	6020 ( )	9014M <sup>2</sup>		)	
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В	included in thi	s report follower arrative QC data	equired for the did, including the did not me	requirement to r	note and	•	Ye	9	No <sup>1</sup>
С	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?								
D	VPH and EPH methods only: Was the VPH or EPH Method conducted without significant modifications (see Section 11.3 of respective Methods)?  Yes NA N						ON Q		
	A response	to questions	E and F below	is required for	"Presumptive	Certaint	y" state	us	
E	the contract of the	erformance sta nods achieved?	ndards and rec	ommendations	for the		Ye	es (No	
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	Signature:	M	Hester		Position	: <u>Labora</u>	atory D	irector	
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Tale 12 Same and	SVIRONMENTAL TESTING	CT DPH 0484	NH DES 253901-A		Tel:(413)572-4000			8)667-1400	

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aboratory	Name:	TestAmeric	a Westfield		Proj	ect#:	360-1	1839-1
Project Loc	ation:				MADEP F	RTN1:		
	rovides certific	ations for the fo	ollowing data se	et:[list Laboratory	Sample ID Nur	nber(s)]		
Sample Ma	trices:	Groundwater	Soil/S	ediment	Drinking Wate	r Oth	ner:	V-
MCP SW-	846	8260B( )	8151A ( )	8330 ( )	6010B(x)	7470A/1A		Other ( )
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В	included in this	s report followed arrative QC data	d, including the	specified analyti requirement to r leet appropriate p	note and		Yes	) No¹
6	Does the analytical data included in this report meet all the requirements for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of the MADEP document CAM VII A, " Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?							
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F	Were results f method(s) rep		st compounds/e	elements for the s	specified		Yes	N/A (No
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	Signature:	The	Will		Position	Labora	tory Dire	ector
		Steven C. Ha	artmann		Date	93	5.07	100
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Laboratory	Name:	TestAmeric	a Westfield		Proj	ect#:	360-	11839-1	
Project Loc	cation:				MADEP F	RTN <sup>1</sup> :			
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Sample Ma	atrices:	Groundwater	Soil/Se	ediment	Drinking Wate	r Oth	er:		
MCP SW		8260B( )	8151A()	8330 ( )	6010B()	7470A/1A	()	Other (x	)
Methods	Used	8270C( )	8081A ( )	VPH()	6020 ( )	9014M <sup>2</sup> /9	9012 (	)	
annual inte	d in MADEP	8082 ( )	8021B ( )	EPH()	7000 S³( )	7196A (	)		
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В	included in this	C procedures reserved followed arrative QC data uidelines?	d, including the	requirement to	note and		Yes	P No <sup>1</sup>	
С	Does the analytical data included in this report meet all the requirements  for "Presumptive Certainty", as described in Section 2.0 (a), (b), (c) and (d) of  the MADEP document CAM VII A, " Quality Assurance and Quality  Control Guidelines for the Acquisition and Reporting of Analytical Data"?						lo <sup>1</sup>		
D		methods only difications (see			d conducted with hods)?	out	Yes		No <sup>1</sup>
	A response	to questions l	and F below	is required for	"Presumptive	Certainty'	' status		
E	Were all QC p	erformance sta					Yes		
F	Were results for method(s) rep	or all analyte-lis orted?	t compounds/el	ements for the	specified		Yes	(N/A)	No <sup>1</sup>
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analytical	report is, to th	e best of my k	nowledge and	belief, accurat	te and complete	е.			
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TestA	merica	MADEP MA014 NY DOH 10843 RI DOH 57 CT DPH 0494	NELAP FL E87912 TOX NELAP NJ MA008 TOX NELAP NY 10843 NH DES 253901-A	ne A	TestAmerica Westfield S3 Southampton Rd, Westfield, MA 01085 Tel:(413)572-4000		Boston Serv 148 Range N.Billerica Tet:(978)6	rice Center eway Rd a. MA 01862	

#### CASE NARRATIVE

Client: Olin Corporation

Project: Plant B Quarterly 6300060010

Report Number: 360-11839-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues as stipulated in the MCP reporting requirements.

In order to facilitate report review, a separate MCP Analytical Method Report Certification Form is included for each method requested.

It should be noted that samples with elevated Reporting Limits (RLs) as a result of a dilution may not be able to satisfy "MCP program" reporting limits in some cases if the "adjusted" RL is greater than the applicable MCP standards or criterion to which the concentration is being compared. Such increases in the RLs are unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes which exceed the calibration range.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

The samples were received on 08/22/2007; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 1.2°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2°C of the required temperature or method specified range. For samples with a specified temperature of 4°C, samples with a temperature ranging from just above freezing temperature of water to 6°C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC and MADEP standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

#### **VOLATILE ORGANICS**

Samples 360-11839-1 through 360-11839-3 were analyzed for volatile organics in accordance with EPA SW846 Method 8260B. The samples were analyzed on 08/28/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved with the exception of:

2,4,4-Trimethyl-1-pentene failed the MS/MSD recovery criteria low for the matrix spike of sample 360-11839-1. Refer to the QC report for details.

General method information:

Samples 360-11839-1 and 360-11839-2(5X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentration.

#### **VOLATILE PETROLEUM HYDROCARBONS**

Samples 360-11839-1 and 360-11839-2 were analyzed for volatile petroleum hydrocarbons in accordance with MADEP VPH. The samples were analyzed on 08/23/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

#### SEMIVOLATILE ORGANICS

Samples 360-11839-1 and 360-11839-2 were analyzed for semivolatile organics in accordance with EPA SW846 Method 8270C. The samples were prepared on 08/23/2007 and analyzed on 08/28/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved with the exception of:

Phenol-d5 failed the surrogate recovery criteria low for the method blank, LCS, LCSD, and samples 360-11839-(1-2, 1MS/MSD). 2,4,6-Tribromophenol failed the surrogate recovery criteria high for samples 360-11839-1 (1X and 10X) and 360-11839-2 (10X only). The failed surrogates are acid compounds. Only base-neutral compounds are reported for this job. Refer to individual samples for recoveries.

N-Nitrosodiphenylamine failed the MS/MSD recovery criteria low for the matrix spike duplicate of sample 360-11839-1. N-Nitrosodiphenylamine exceeded the MS/MSD rpd limit. The sample concentration overwhelmed the amount of spike added. Refer to the QC report for details.

#### General method information:

Bis(2-ethylhexyl) phthalate was detected in method blank MB 360-22487/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged "J". If the associated sample reported a result above the MDL and/or RL, the result has been "B" flagged. Refer to the QC report for details.

Samples 360-11839-1 and 360-11839-2(10X) required dilution prior to analysis. The reporting limits have been adjusted accordingly. Dilutions were due to high target concentration.

#### DISSOLVED METALS

Samples 360-11839-1 and 360-11839-2 were analyzed for dissolved metals in accordance with EPA SW846 Method 6010B. The samples were analyzed on 08/23/2007.

All QA/QC procedures required to meet Presumptive Certainty for the specified analytical method were performed as per section B of the MADEP MCP analytical method report Certification form.

All QC performance standards and recommendations, which may affect Data Usability for this specific method, were achieved.

General method information:

At the request of the client, a non-MCP analyte list was reported for this job. Only Iron was requested.

The following reported methods are not listed in the MADEP Massachusetts Contingency Plan (MCP) Compendium of Analytical Methods (CAM), pursuant to the provisions of 310 CMR 40.0017(2).

#### AMMONIA

Samples 360-11839-1 and 360-11839-2 were analyzed for ammonia in accordance with LACHAT 10-107-06-1. The samples were prepared on 08/28/2007 and 08/30/2007 and analyzed on 08/30/2007.

All QC performance standards and recommendations for this specific method were achieved.

#### PH

Samples 360-11839-1 and 360-11839-2 were analyzed for pH in accordance with SM 4500 H+ B. The samples were analyzed on 08/23/2007.

All QC performance standards and recommendations for this specific method were achieved.

This case narrative is available in Word format upon request.

#### **METHOD SUMMARY**

Client: Olin Corporation

Job Number: 360-11839-1

Description	Lab Location	Method	Preparation Method
Matrix: Water			
Volatile Organic Compounds (Custom List)	TAL WFD	SW846 8260B	
Purge-and-Trap	TAL WFD		SW846 5030B
MADEP - Volatile Petroleum Hydrocarbons	TAL WFD	MA DEP MAVE	PH
Purge-and-Trap	TAL WFD		SW846 5030B
Semivolatile Organic Compounds by GCMS - Low Levels	TAL WFD	SW846 8270C	
Separatory Funnel Liquid-Liquid Extraction	TAL WFD		SW846 3510C
Dissolved Metals	TAL WFD	SW846 6010B	
Sample Filtration performed in the Field	TAL WFD		FIELD_FLTRD
Lachat Ammonia-Nitrogen	TAL WFD	QuickChem 10	-107-06-1
Distillation/Ammonia	TAL WFD		Distill/Ammonia
рН	TAL WFD	SM19 SM 4500	) H+ B

#### Lab References:

TAL WFD = TestAmerica Westfield

#### Method References:

MA DEP = Massachusetts Department Of Environmental Protection

QuickChem = Lachat Instruments

SM19 = "Standard Methods For The Examination Of Water And Wastewater", 19Th Edition, 1995."

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

### METHOD / ANALYST SUMMARY

Client: Olin Corporation

Job Number: 360-11839-1

Method	Analyst	Analyst ID
SW846 8260B	Weigel, Brian	BW
SW846 8270C	Sullivan, Pat J	PJS
MA DEP MAVPH	Doane, Jessica L	JLD
SW846 6010B	Nasiatka, Ellen M	EMN
QuickChem 10-107-06-1	Lalashius, Andrew L	ALL
SM19 SM 4500 H+ B	Emerich, Rich W	RWE

#### SAMPLE SUMMARY

Client: Olin Corporation

Job Number: 360-11839-1

Lab Sample ID	Client Sample ID	Client Matrix	Date/Time Sampled	Date/Time Received		
360-11839-1	GW16	Ground Water	08/21/2007 1535	08/22/2007 1630		
360-11839-1MS	GW16 MS	Ground Water	08/21/2007 1535	08/22/2007 1630		
360-11839-1MSD	GW16 MSD	Ground Water	08/21/2007 1535	08/22/2007 1630		
360-11839-2	GW16 DUP	Ground Water	08/21/2007 1535	08/22/2007 1630		
360-11839-3TB	Trip Blank	Water	08/21/2007 1535	08/22/2007 1630		

### **SAMPLE RESULTS**

Job Number: 360-11839-1

Client Sample ID: GW16 Lab Sample ID: 360-11839-1 Date Sampled: 08/21/2007 1535

Date Received: 08/22/2007 1630

Client Matrix: Ground Water

Analyte	Result/Qua	alifier	Unit	MDL	RL	Dilution
Method: 8260B			Date A	nalyzed:	08/28/2007 2011	
Prep Method: 5030B				repared:	08/28/2007 2011	
2,4,4-Trimethyl-1-pentene	290 J		ug/L	1.0	5.0	5.0
2,4,4-Trimethyl-2-pentene	85		ug/L	1.0	5.0	5.0
Surrogate					Acceptance Limits	
1,2-Dichloroethane-d4 (Surr)	93	(9)	%	VI VIII.	70 - 130	
4-Bromofluorobenzene	109		%		70 - 130	
Dibromofluoromethane	103		%		70 - 130	
Toluene-d8 (Surr)	95 /		%		70 - 130	
Method: 8270C			Date A	nalyzed:	08/28/2007 0048	
Prep Method: 3510C	DN			repared:	08/23/2007 1152	
Bis(2-ethylhexyl) phthalate	1.8—	18	ug/L	0.13		1.0
Surrogate	~				Acceptance Limits	
2,4,6-Tribromophenol	(UI)	X	%		15 - 110	
2-Fluorobiphenyl	77		%		30 - 130	
2-Fluorophenol	22		%		15 - 110	
Nitrobenzene-d5	88		%		30 - 130	
Phenol-d5	(14)	X	%		15 - 110	
Terphenyl-d14	97		%		30 - 130	
Method: 8270C			Date A	nalyzed:	08/28/2007 1420	
Prep Method: 3510C			Date P	repared:	08/23/2007 1152	
N-Nitrosodiphenylamine	160	5	ug/L	2.2	52	10
Surrogate					Acceptance Limits	
2,4,6-Tribromophenol	(186)	X	%	9 8 6464	15 - 110	
2-Fluorobiphenyl	88		%		30 - 130	
2-Fluorophenol	24		%		15 - 110	
Nitrobenzene-d5	115		%		30 - 130	
Phenol-d5	11	X	%		15 - 110	
Terphenyl-d14	110		%		30 - 130	
Method: Dissolved-6010B			Date A	nalyzed:	08/23/2007 1217	
Iron ·	810		ug/L	14	100	1.0

Job Number: 360-11839-1

Client Sample ID: GW16 Lab Sample ID: 360-11839-1 Date Sampled: 08/21/2007 1535
Date Received: 08/22/2007 1630
Client Matrix: Ground Water

Analyte	Result/Qualifier	Unit	RL	. , RL	Dilutio
Method: MAVPH		Date A	nalyzed:	08/23/2007 1912	
Prep Method: 5030B			repared:	08/23/2007 1912	
Benzene	ND	ug/L	5.0	5.0	1.0
Ethylbenzene	ND	ug/L	5.0	5.0	1.0
m-Xylene & p-Xylene	ND	ug/L	10	10	1.0
Methyl tert-butyl ether	ND	ug/L	5.0	5.0	1.0
Naphthalene	ND	ug/L	10	10	1.0
o-Xylene	ND	ug/L	5.0	5.0	1.0
Toluene	ND	ug/L	5.0	5.0	1.0
C5-C8 Aliphatics (unadjusted)	810	ug/L	100	100	1.0
C9-C12 Aliphatics (unadjusted)	ND	ug/L	100	100	1.0
C5-C8 Aliphatics (adjusted)	810	ug/L	100	100	1.0
C9-C12 Aliphatics (adjusted)	ND	ug/L	100	100	1.0
C9-C10 Aromatics	ND	ug/L	100	100	1.0
Total VPH	810	ug/L	100	100	1.0
Surrogate				Acceptance Limits	
2,5-Dibromotoluene (fid)	100	%		70 - 130	
2,5-Dibromotoluene (pid)	102	%		70 - 130	
Method: 10-107-06-1		Date A	nalyzed:	08/30/2007 1529	
Prep Method: Distill/Ammonia		Date Pr	repared:	08/30/2007 0925	
Ammonia	5.9	mg/L	0.10	0.10	1.0
Method: SM 4500 H+ B	Y	Date A	nalyzed:	08/23/2007 0755	
pH	5.96 J HF	SU	0.10	0.100	1.0

Job Number: 360-11839-1

Client Sample ID: GW16 DUP Lab Sample ID: 360-11839-2 Date Sampled: 08/21/2007 1535 Date Received: 08/22/2007 1630 Client Matrix: Ground Water

Analyte	Result/Qu	alifier	Unit	MDL	RL	Dilution
Method: 8260B			Date A	nalyzed:	08/28/2007 2038	
Prep Method: 5030B	~ ~		Date P	repared:	08/28/2007 2038	
2,4,4-Trimethyl-1-pentene	340		ug/L	1.0	5.0	5.0
2,4,4-Trimethyl-2-pentene	110	4	ug/L	1.0	5.0	5.0
Surrogate					Acceptance Limits	
1,2-Dichloroethane-d4 (Surr)	97		%	1 1000111	70 - 130	et-time and introduce
4-Bromofluorobenzene	111		%		70 - 130	
Dibromofluoromethane	104	ě	%		70 - 130	
Toluene-d8 (Surr)	94		%		70 - 130	
Method: 8270C			Date A	nalyzed:	08/28/2007 0152	
Prep Method: 3510C	ND			repared:	08/23/2007 1152	
Bis(2-ethylhexyl) phthalate	1.4	-J-B-	ug/L	0.13		1.0
Surrogate					Acceptance Limits	
2,4,6-Tribromophenol	102		%		15 - 110	
2-Fluorobiphenyl	73		%		30 - 130	
2-Fluorophenol	20		%		15 - 110	
Nitrobenzene-d5	82		%		30 - 130	
Phenol-d5_	(12)	X	%		15 - 110	
Terphenyl-d14	87		%		30 - 130	
Method: 8270C			Date A	nalyzed:	08/28/2007 1441	
Prep Method: 3510C	_	_	Date P	repared:	08/23/2007 1152	
N-Nitrosodiphenylamine	140 _	)	ug/L	2.1	51	10
Surrogate					Acceptance Limits	
2,4,6-Tribromophenol	(171)	X	%		15 - 110	
2-Fluorobiphenyl	80		%		30 - 130	
2-Fluorophenol	21	37	%		15 - 110	
Nitrobenzene-d5	107		%		30 - 130	
Phenol-d5	12	X	%		15 - 110	
Terphenyl-d14	93		%		30 - 130	
Method: Dissolved-6010B			Date A	nalyzed:	08/23/2007 1227	
Iron	800		ug/L	14	100	1.0

Client Sample ID: GW16 DUP Lab Sample ID: 360-11839-2

Date Sampled: 08/21/2007 1535 Date Received: 08/22/2007 1630 Client Matrix: Ground Water

Job Number: 360-11839-1

Analyte	Result/Qualifier	Unit	RL	RL	Dilution
Method: MAVPH		Date A	nalyzed:	08/23/2007 1946	
Prep Method: 5030B		Date P	repared:	08/23/2007 1946	
Benzene	ND	ug/L	5.0	5.0	1.0
Ethylbenzene	ND	ug/L	5.0	5.0	1.0
m-Xylene & p-Xylene	ND	ug/L	10	10	1.0
Methyl tert-butyl ether	ND	ug/L	5.0	5.0	1.0
Naphthalene	ND	ug/L	10	10	1.0
o-Xylene	5.2	ug/L	5.0	5.0	1.0
Toluene	ND	ug/L	5.0	5.0	1.0
C5-C8 Aliphatics (unadjusted)	770	ug/L	100	100	1.0
C9-C12 Aliphatics (unadjusted)	ND	ug/L	100	100	1.0
C5-C8 Aliphatics (adjusted)	770	ug/L	100	100	1.0
C9-C12 Aliphatics (adjusted)	ND	ug/L	100	100	1.0
C9-C10 Aromatics	ND	ug/L	100	100	1.0
Total VPH	770	ug/L	100	100	1.0
Surrogate				Acceptance Limits	
2,5-Dibromotoluene (fid)	105	%		70 - 130	
2,5-Dibromotoluene (pid)	104	%		70 - 130	
Method: 10-107-06-1		Date A	nalyzed:	08/30/2007 1524	
Prep Method: Distill/Ammonia			repared:	08/28/2007 1145	
Ammonia	5.9	mg/L	0.10	0.10	1.0
Method: SM 4500 H+ B	- g	Date A	nalyzed:	08/23/2007 0816	
ρH	6.03 \ NF	SU	0.10	0 0.100	1.0

Job Number: 360-11839-1

Client Sample ID: Trip Blank Lab Sample ID: 360-11839-3 Date Sampled: 08/21/2007 1535 Date Received: 08/22/2007 1630

Client Matrix: Water

Analyte	Rest	ılt/Qualifier	Unit	MDL	RL	Dilution
Method: 8260B			Date A	nalyzed: 08	/28/2007 2104	
Prep Method: 5030B			Date P	repared: 08	/28/2007 2104	
2,4,4-Trimethyl-1-pentene	ND		ug/L	0.20	1.0	1.0
2,4,4-Trimethyl-2-pentene	ND		ug/L	0.20	1.0	1.0
Surrogate				A	Acceptance Limits	iĝ
1,2-Dichloroethane-d4 (Surr)	96	24 24 34 45	%	The Control	70 - 130	7///
4-Bromofluorobenzene	111		%		70 - 130	
Dibromofluoromethane	102	2 /	%	×	70 - 130	
Toluene-d8 (Surr)	93		%		70 - 130	

#### **DATA REPORTING QUALIFIERS**

Client: Olin Corporation

Job Number: 360-11839-1

Lab Section	Qualifier	Description
GC/MS VOA	The State of	
	F	MS or MSD exceeds the control limits
GC/MS Semi VOA		
	В	Compound was found in the blank and sample.
9	4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
	J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
	X	Surrogate exceeds the control limits
General Chemistry		
	HF	Field parameter with a holding time of 15 minutes

### **QUALITY CONTROL RESULTS**

Client: Olin Corporation

Job Number: 360-11839-1

#### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC/MS VOA		No positive service	-	Substitution of the Market House, Assessment of the Market House, Assessment of the Market House, Assessment House, Assessment of the Market House, Assessment House, Assessme	
Analysis Batch:360-226	83	1 10 10 11 (0.00)			
LCS 360-22683/1	Lab Control Spike	T	Water	8260B	
LCSD 360-22683/2	Lab Control Spike Duplicate	T	Water	8260B	
MB 360-22683/5	Method Blank	T	Water	8260B	
360-11839-1	GW16	Т	Water	8260B	
360-11839-1MS	Matrix Spike	Т	Water	8260B	
360-11839-1MSD	Matrix Spike Duplicate	- T	Water	8260B	
360-11839-2	GW16 DUP	T	Water	8260B	
360-11839-3TB	Trip Blank	T	Water	8260B	
Report Basis		100			
T = Total				201	
i – Total	- A				
GC/MS Semi VOA		₩ =		((1)	
4 1 manual no 1 no 1	as sa se ye		***************************************	* - <del></del>	
Prep Batch: 360-22487	Lab Castel Calles	~	10/	3510C	
LCS 360-22487/2-A	Lab Control Spike	Ţ	Water	3510C 3510C	
LCSD 360-22487/3-A	Lab Control Spike Duplicate	Ţ	Water Water	3510C	
MB 360-22487/1-A	Method Blank		Water	3510C	
360-11839-1	GW16	Ť	Water	3510C	
360-11839-1MS	Matrix Spike		Water	3510C	
360-11839-1MSD	Matrix Spike Duplicate	T T			
360-11839-2	GW16 DUP	1	Water	3510C	
Analysis Batch:360-226	612				
LCS 360-22487/2-A	Lab Control Spike	Τ	Water	8270C	360-22487
LCSD 360-22487/3-A	Lab Control Spike Duplicate	T	Water	8270C	360-22487
MB 360-22487/1-A	Method Blank	Τ	Water	8270C	360-22487
360-11839-1	GW16	Т	Water	8270C	360-22487
360-11839-1MS	Matrix Spike	T	Water	8270C	360-22487
360-11839-1MSD	Matrix Spike Duplicate	T	Water	8270C	360-22487
360-11839-2	GW16 DUP	Т	Water	8270C	360-22487

#### Report Basis

T = Total

Client: Olin Corporation

Job Number: 360-11839-1

#### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
GC VOA			10 F-04 (97 )	(1	
Analysis Batch:360-225	516		1=17=11	00-16 - 6-1	4 13 14 14 14 14 14 14 14 14 14 14 14 14 14
LCS 360-22516/1	Lab Control Spike	Т	Water	MAVPH	
LCSD 360-22516/2	Lab Control Spike Duplicate	T	Water	MAVPH	
MB 360-22516/3	Method Blank	T	Water	MAVPH	
360-11839-1	GW16	T	Water	MAVPH	
360-11839-1MS	Matrix Spike	Т	Water	MAVPH	
360-11839-1MSD	Matrix Spike Duplicate	T	Water	MAVPH	
360-11839-2	GW16 DUP	Τ.	Water	MAVPH	
Report Basis					
T = Total		≅	(9)		
Metals					
	4	*** ** * * * ****	A. <del>1 </del>		*******
Analysis Batch:360-224		2	WWW.500.000.000		
LCS 360-22490/7	Lab Control Spike	2.2	Water	6010B	
LCSD 360-22490/18	Lab Control Spike Duplicate	<u>T</u>	Water	6010B	
MB 360-22490/8	Method Blank	Ţ	Water	6010B	
360-11839-1	GW16	D	Water	6010B	
360-11839-1MS	Matrix Spike	D	Water	6010B	
360-11839-1MSD	Matrix Spike Duplicate	D	Water	6010B	
360-11839-2	GW16 DUP	D	Water	6010B	

#### Report Başiş

D = Dissolved

T = Total

Client: Olin Corporation

Job Number: 360-11839-1

#### **QC Association Summary**

Lab Sample ID	Client Sample ID	Report Basis	Client Matrix	Method	Prep Batch
General Chemistry					
Analysis Batch:360-22	2496				Management Interest
LCS 360-22496/1	Lab Control Spike	T	Water	SM 4500 H+ B	
360-11839-1	GW16	T	Water	SM 4500 H+ B	
360-11839-1DU	Duplicate	T	Water	SM 4500 H+ B	
360-11839-2	GW16 DUP	T	Water	SM 4500 H+ B	
Prep Batch: 360-22625	5				
LCS 360-22625/2-A	Lab Control Spike	Т	Water	Distill/Ammonia	
MB 360-22625/1-A	Method Blank	т	Water	Distill/Ammonia	
360-11839-2	GW16 DUP	T	Water	Distill/Ammonia	
Prep Batch: 360-22719	E 3		6	27	
LCS 360-22719/2-A	Lab Control Spike	T	Water	Distill/Ammonia	
MB 360-22719/1-A	Method Blank	÷	Water	Distill/Ammonia	
360-11839-1	GW16	÷	Water	Distill/Ammonia	
360-11839-1MS	Matrix Spike	Ť	Water	Distill/Ammonia	
360-11839-1MSD	Matrix Spike Duplicate	Ť	Water	Distill/Ammonia	
Analysis Batch-200 22	999				4 _ 0
Analysis Batch:360-22			10/-1	40 407 00 4	360-22625
_CS 360-22625/2-A	Lab Control Spike	Ţ	Water	10-107-06-1	
MB 360-22625/1-A	Method Blank	Ţ	Water	10-107-06-1	360-22625
860-11839-2	GW16 DUP	T	Water	10-107-06-1	360-22625
Analysis Batch:360-22		1820	7040 E	Out official lines of the	
_CS 360-22719/2-A	Lab Control Spike	Т	Water	10-107-06-1	360-22719
MB 360-22719/1-A	Method Blank	T	Water	10-107-06-1	360-22719
860-11839-1	GW16	T	Water	10-107-06-1	360-22719
860-11839-1MS	Matrix Spike	т	Water	10-107-06-1	360-22719
360-11839-1MSD	Matrix Spike Duplicate	T	Water	10-107-06-1	360-22719

### Report Basis T = Total

Client: Olin Corporation

Job Number: 360-11839-1

Method Blank - Batch: 360-22683

Method: 8260B Preparation: 5030B

Lab Sample ID: MB 360-22683/5

Client Matrix: Dilution:

Water 1.0

Date Analyzed: 08/28/2007 1945 Date Prepared: 08/28/2007 1945 Analysis Batch: 360-22683

Prep Batch: N/A Units: ug/L

Instrument ID: HP 5890/5972 GC/MS

Lab File ID: V41191.D Initial Weight/Volume: 25 mL Final Weight/Volume: 25 mL

Analyte	Result	Qual MDL	RL
2,4,4-Trimethyl-1-pentene	ND /	0.20	1.0
2,4,4-Trimethyl-2-pentene	ND V	0.20	1.0
Surrogate	% Rec	Acceptance Limits	
1,2-Dichloroethane-d4 (Surr)	96	70 - 130	
4-Bromofluorobenzene	109	70 - 130	
Dibromofluoromethane	105	70 - 130	
Toluene-d8 (Surr)	92	70 - 130	

Lab Control Spike/

Lab Control Spike Duplicate Recovery Report - Batch: 360-22683

Method: 8260B Preparation: 5030B

LCS Lab Sample ID: LCS 360-22683/1

Client Matrix: Dilution:

Water

Date Analyzed:

1.0

Date Prepared:

08/28/2007 1734 08/28/2007 1734 Analysis Batch: 360-22683

Prep Batch: N/A

Units: ug/L

Instrument ID: HP 5890/5972 GC/MS

Lab File ID: V41186.D

Initial Weight/Volume: 25 mL

Final Weight/Volume: 25 mL

LCSD Lab Sample ID: LCSD 360-22683/2

Client Matrix: Dilution:

Water

Date Analyzed: Date Prepared:

1.0 08/28/2007 1800

08/28/2007 1800

Analysis Batch: 360-22683

Prep Batch: N/A Units: ug/L

Instrument ID:

HP 5890/5972 GC/MS

Lab File ID: V41187.D

Initial Weight/Volume: 25 mL Final Weight/Volume: 25 mL

		% Rec.				
Analyte	LCS	LCSD	Limit	RPD	RPD Limit	LCS Qual LCSD Qual
2,4,4-Trimethyl-1-pentene	88	85 ./	70 - 130	4	25	
2,4,4-Trimethyl-2-pentene	94	90	70 - 130	4	25	*
Surrogate		LCS % Rec	LCSD %	Rec	Accep	otance Limits
1,2-Dichloroethane-d4 (Surr)		99	97		7	0 - 130
4-Bromofluorobenzene		99	97		. 7	'0 - 130
Dibromofluoromethane		99	97		7	0 - 130
Toluene-d8 (Surr)		101	103		7	'0 <b>-</b> 130

Calculations are performed before rounding to avoid round-off errors in calculated results.

Client: Olin Corporation

Job Number: 360-11839-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22683

Method: 8260B

Preparation: 5030B

MS Lab Sample ID:

360-11839-1

Analysis Batch: 360-22683

Instrument ID: HP 5890/5972 GC/MS

Client Matrix:

Water

Dilution:

5.0

Lab File ID:

V41188.D

Initial Weight/Volume: 25 mL

Date Analyzed: Date Prepared: 08/28/2007 1826 08/28/2007 1826 Final Weight/Volume: 25 mL

MS Qual MSD Qual

MSD Lab Sample ID: 360-11839-1

Analysis Batch: 360-22683

Prep Batch: N/A

Instrument ID: HP 5890/5972 GC/MS

Client Matrix:

Dilution:

Water

Prep Batch: N/A

Lab File ID: V41189.D Initial Weight/Volume: 25 mL

Date Analyzed: Date Prepared: 08/28/2007 1853 08/28/2007 1853

Final Weight/Volume: 25 mL

Analyte 2,4,4-Trimethyl-1-pentene 2,4,4-Trimethyl-2-pentene

% Rec. MS 65

Limit MSD 70 - 130 90 70 - 130 105

30

Surrogate	\$ \$000,000,000 <b>0000000</b> \$ \$400 <b>\$400 \$400</b> \$400 \$400 \$400 \$400 \$400 \$400	MS % Rec	MSD % Rec	Acceptance Limits
1,2-Dichloro	ethane-d4 (Surr)	96	97	70 - 130
4-Bromofluc	robenzene	102	104	70 - 130
Dibromofluo	romethane	99	98	70 - 130
Toluene-d8	(Surr)	100	100	70 - 130

Client: Olin Corporation

Job Number: 360-11839-1.

Method Blank - Batch: 360-22487

Method: 8270C Preparation: 3510C

Lab Sample ID: MB 360-22487/1-A

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/27/2007 2008 Date Prepared: 08/23/2007 1152 Analysis Batch: 360-22612 Prep Batch: 360-22487

Units: ug/L

Instrument ID: Agilent 6890/5973 GC/MS

Lab File ID: B7005.D

Initial Weight/Volume: 1000 mL Final Weight/Volume: 1.0 mL

Injection Volume:

Result	Qual	MDL	RL	
(0.49)	J	0.13	5.0	1
ND		0.21	5.0	
% Rec		Acceptance Limits		
80		15 - 110		
79		30 - 130		
23		15 - 110		
83		30 - 130		
12	X	15 - 110		
104		30 - 130		
	0.49 ND % Rec 80 79 23 83 12	0.49 J % Rec 80 79 23 83 12 X	0.49 J 0.13 0.21  % Rec Acceptance Limits  80 15 - 110  79 30 - 130  23 15 - 110  83 30 - 130  12 X 15 - 110	0.49 J 0.13 5.0 0.21 5.0 WRec Acceptance Limits  80 15 - 110 79 30 - 130 23 15 - 110 83 30 - 130 12 X 15 - 110

Client: Olin Corporation

Job Number: 360-11839-1

Lab Control Spikel

Lab Control Spike Duplicate Recovery Report - Batch: 360-22487

Method: 8270C Preparation: 3510C

LCS Lab Sample ID: LCS 360-22487/2-A

Client Matrix:

Water

Dilution:

1.0

Date Analyzed: Date Prepared: 08/27/2007 2030

08/23/2007 1152

LCSD Lab Sample ID: LCSD 360-22487/3-A Client Matrix:

Water

Dilution:

1.0

Date Analyzed: Date Prepared: 08/27/2007 2051

08/23/2007 1152

Analysis Batch: 360-22612 Prep Batch: 360-22487

Prep Batch: 360-22487

Units: ug/L

Units: ug/L

Instrument ID: Agilent 6890/5973 GC/MS

Lab File ID: B7006.D

Initial Weight/Volume:

1000 mL

Final Weight/Volume:

1.0 mL

Injection Volume:

Analysis Batch: 360-22612 Instrument ID: Agilent 6890/5973 GC/MS

Lab File ID: B7007.D

Initial Weight/Volume: 1000 mL

Final Weight/Volume: 1.0 mL

Injection Volume:

		% Rec.			· ·
Analyte	LCS	LCSD	Limit	RPD	RPD Limit LCS Qual LCSD Qual
Bis(2-ethylhexyl) phthalate	102	104	40 - 140	. 2	20
N-Nitrosodiphenylamine	96	99 V	40 - 140	3	20
Surrogate		LCS % Rec	LCSD %	Rec	Acceptance Limits
2,4,6-Tribromophenol		94	95	(*)	15 - 110
2-Fluorobiphenyl		77	80		30 - 130
2-Fluorophenol		22	25		15 - <b>11</b> 0
Nitrobenzene-d5		81	83		30 - 130
Phenol-d5		12 X	14	X	15 - <b>11</b> 0
Terphenyl-d14	į	90	88		30 - 130

Client: Olin Corporation

Job Number: 360-11839-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22487

Method: 8270C Preparation: 3510C

MS Lab Sample ID:

360-11839-1 Water

Analysis Batch: 360-22612

Instrument ID: Agilent 6890/5973 GC/MS

Client Matrix:

Prep Batch: 360-22487

B7019.D

Dilution:

1.0

Lab File ID:

Date Analyzed: Date Prepared:

08/28/2007 0109 08/23/2007 1152 Initial Weight/Volume: 990 mL Final Weight/Volume: 1.0 mL

Injection Volume:

MSD Lab Sample ID: 360-11839-1

Analysis Batch: 360-22612

Instrument ID: Agilent 6890/5973 GC/MS

Client Matrix:

Water

Lab File ID: B7020.D

Dilution:

1.0

Prep Batch: 360-22487

Initial Weight/Volume: 990 mL Final Weight/Volume: 1.0 mL

Date Analyzed: Date Prepared:

08/28/2007 0131 08/23/2007 1152

Injection Volume:

	%	Rec.						
Analyte	MS	MSD	Limit		RPD	RPD Limit	MS Qual	MSD Qual
Bis(2-ethylhexyl) phthalate	89	94	40 -	140	5	20	В	В
N-Nitrosodiphenylamine	88	(-20)	40 -	140	22	20	4	4
Surrogate	10000000	MS % Rec		MSD %	6 Rec	Acce	ptance Limit	s
2,4,6-Tribromophenol		94		104		15	- 110	
2-Fluorobiphenyl		69		73		30	- 130	
2-Fluorophenol		20		20		15	5 - 110	
Nitrobenzene-d5		76		81		30	- 130	
Phenol-d5		12	X	12	X	15	5 - 110	
Terphenyl-d14		83		87		30	- 130	

Client: Olin Corporation

Job Number: 360-11839-1

Method Blank - Batch: 360-22516

Method: MAVPH Preparation: 5030B

Lab Sample ID: MB 360-22516/3

Client Matrix: Water Dilution:

1.0

Date Analyzed: 08/23/2007 1839 Date Prepared: 08/23/2007 1839 Analysis Batch: 360-22516

Prep Batch: N/A Units: ug/L

Instrument ID: HP 5890II GC w/ PID/FID

Lab File ID: G08230.D Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Injection Volume:

Column ID: PRIMARY

Analyte	Result	Qual	RL	RL	
Benzene	ND		5.0	5.0	
Ethylbenzene	ND .		5.0	5.0	
m-Xylene & p-Xylene	ND		10	10	
Methyl tert-butyl ether	ND		5.0	5.0	
Naphthalene	ND		10	10	
o-Xylene	ND		5.0	5.0	
Toluene	ND		5.0	5.0	
C5-C8 Aliphatics (unadjusted)	ND		100	100	
C9-C12 Aliphatics (unadjusted)	ND	271	100	100	
C5-C8 Aliphatics (adjusted)	ND	/	100	100	
C9-C12 Aliphatics (adjusted)	ND /		100	100	
C9-C10 Aromatics	ND /		100	100	
Total VPH	ND V		100	100	
Surrogate	% Rec		Acceptance Lim	its	
2,5-Dibromotoluene (fid)	98		70 - 130		100/W1==3.01.5W1
2,5-Dibromotoluene (pid)	104		70 - 130		

Client: Olin Corporation

Job Number: 360-11839-1

Lab Control Spike/

Lab Control Spike Duplicate Recovery Report - Batch: 360-22516

Method: MAVPH Preparation: 5030B

LCS Lab Sample ID: LCS 360-22516/1

Client Matrix:

Water

Dilution:

1.0

Date Analyzed: Date Prepared: 08/23/2007 1700

08/23/2007 1700

Analysis Batch: 360-22516

Prep Batch: N/A

Units: ug/L

Instrument ID: HP 5890II GC w/ PID/FID Lab File ID:

G08227.D Initial Weight/Volume:

5 mL Final Weight/Volume: 5 mL

Injection Volume:

Column ID:

PRIMARY

LCSD Lab Sample ID: LCSD 360-22516/2

Client Matrix:

Water

Dilution:

1.0

Date Analyzed: Date Prepared:

08/23/2007 1733 08/23/2007 1733 Analysis Batch: 360-22516

Prep Batch: N/A

Units: ug/L

HP 5890II GC w/ PID/FID Instrument ID:

Lab File ID: G08228.D Initial Weight/Volume: 5 mL

Final Weight/Volume: 5 mL

Injection Volume:

Column ID:

PRIMARY

			% Rec.					
Analyte		LCS	LCSD	Limit	RPD	<b>RPD Limit</b>	LCS Qual	LCSD Qual
Benzene		99	96	70 - 130	3	25		HI WAREL NAME
Ethylbenzene		97	94	70 - 130	3	25		
m-Xylene & p-Xylene		95	92	70 - 130	3	25		200
Methyl tert-butyl ether		89	88	70 - 130	0	25		
Naphthalene		84	82	70 - 130	2	25		
o-Xylene		93	91	70 - 130	3	25		
Toluene		98	96	70 - 130	3	25		
C5-C8 Aliphatics (unadjusted)		102	98	70 - 130	3	25		
C9-C12 Aliphatics (unadjusted)		99	97	70 - 130	2	25		
C9-C10 Aromatics	1	100	96 /	70 - 130	4	25		
Surrogate		/	LCS % Rec	LCSD %	Rec	Accep	otance Limits	
2,5-Dibromotoluene (fid)			100	100		7	0 - 130	
2,5-Dibromotoluene (pid)			94	91		7	0 - 130	
4 - 14 - 15 - 16 - 16 - 16 - 16 - 16 - 16 - 16								

Client: Olin Corporation

Job Number: 360-11839-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22516

Method: MAVPH Preparation: 5030B

MS Lab Sample ID:

360-11839-1

Analysis Batch: 360-22516

Instrument ID: HP 5890II GC w/ PID/FID

Client Matrix:

Water

Lab File ID:

Prep Batch: N/A

G08235.D

Dilution:

1.0

Initial Weight/Volume: 5 mL

Date Analyzed:

08/23/2007 2125

Final Weight/Volume: 5 mL

Date Prepared:

08/23/2007 2125

Injection Volume:

PRIMARY

MSD Lab Sample ID: 360-11839-1

Analysis Batch: 360-22516

Column ID:

Instrument ID: HP 5890II GC w/ PID/FID

Client Matrix:

Water

Prep Batch: N/A

Lab File ID: G08236.D

Dilution: Date Analyzed: Date Prepared:

1.0 08/23/2007 2159 08/23/2007 2159 Initial Weight/Volume: 5 mL Final Weight/Volume: 5 mL

Injection Volume:

Column ID:

PRIMARY

	%	Rec.				
Analyte	MS	MSD	Limit	RPD	RPD Limit	MS Qual MSD Qual
Benzene	98	94	70 - 130	4	50	
Ethylbenzene	94	90	70 - 130	4	50	
m-Xylene & p-Xylene	91	88	70 - 130	4	50	
Methyl tert-butyl ether	95	92	70 - 130	3	50	
Naphthalene	84	84	70 - 130	0	50	
o-Xylene	94	91	70 - 130	4	50	
Taluene	96	92	70 - 130	4	50	
C5-C8 Aliphatics (unadjusted)	95	84	70 - 130	5	50	
C9-C12 Aliphatics (unadjusted)	107	103	70 - 130	4	50	
C9-C10 Aromatics	121/	115/	70 - 130	5	50	
Surrogate	/	MS % Rec	MSD 9	% Rec	Acce	eptance Limits
2,5-Dibromotoluene (fid)		101	103		7	0 - 130
2,5-Dibromotoluene (pid)		87	86		7	0 - 130

Client: Olin Corporation

Job Number: 360-11839-1

Method Blank - Batch: 360-22490

Method: 6010B Preparation: N/A

Lab Sample ID: MB 360-22490/8

Analysis Batch: 360-22490

Instrument ID: Varian 720 ES ICP

Client Matrix: Water Dilution: 1.0

Prep Batch: N/A Units: ug/L

Lab File ID: N/A

Date Analyzed: 08/23/2007 1234

Initial Weight/Volume:

Date Prepared: N/A

Final Weight/Volume: mL

Analyte Result Qual MDL RL Iron 14 ND 100

Lab Control Spike/

Lab Control Spike Duplicate Recovery Report - Batch: 360-22490

Method: 6010B Preparation: N/A

LCS Lab Sample ID: LCS 360-22490/7

Water

Client Matrix: Dilution:

1.0

Date Analyzed:

08/23/2007 1232

Date Prepared:

N/A

Analysis Batch: 360-22490

Prep Batch: N/A

Units: ug/L

Instrument ID: Varian 720 ES ICP

Lab File ID: N/A Initial Weight/Volume:

Final Weight/Volume:

10 mL

LCSD Lab Sample ID: LCSD 360-22490/18

Client Matrix: Dilution:

Water

1.0

Date Analyzed:

08/23/2007 1314

Date Prepared:

N/A

Analysis Batch: 360-22490

Prep Batch: N/A

Units: ug/L

Instrument ID:

Varian 720 ES ICP

Lab File ID: N/A Initial Weight/Volume:

Final Weight/Volume: 10 mL

Rec Analyte LCS LCSD Limit RPD RPD Limit LCS Qual LCSD Qual Iron 95 80 - 120 20 98 3

Client: Olin Corporation

Job Number: 360-11839-1

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22490

Method: 6010B Preparation: N/A

MS Lab Sample ID:

360-11839-1

Analysis Batch: 360-22490

Instrument ID: Varian 720 ES ICP

Client Matrix:

Water

Lab File ID:

Dilution:

1.0

Prep Batch: N/A

Initial Weight/Volume:

Date Analyzed:

08/23/2007 1219

Date Prepared:

N/A

Final Weight/Volume: 10 mL

MSD Lab Sample ID: 360-11839-1

Water

Analysis Batch: 360-22490

Instrument ID: Varian 720 ES ICP

Client Matrix: Dilution:

1.0

Prep Batch: N/A

Lab File ID: N/A

Initial Weight/Volume:

Date Analyzed: Date Prepared: 08/23/2007 1222

N/A

Final Weight/Volume: 10 mL

% Rec. MS MSD Limit RPD **RPD Limit** MS Qual MSD Qual Analyte Iron 75 - 125 20 0

Client: Olin Corporation

Job Number: 360-11839-1

Method Blank - Batch: 360-22625

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-22625/1-A

Client Matrix: Dilution:

Water 1.0

Date Analyzed: 08/30/2007 1504 Date Prepared: 08/28/2007 1145 Analysis Batch: 360-22828 Prep Batch: 360-22625

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

Analyte

Ammonia

Result

Qual

RL

RL

0.10 0.10

Lab Control Spike - Batch: 360-22625

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-22625/2-A

Client Matrix: Dilution:

Water 1.0

Date Analyzed: 08/30/2007 1505 Date Prepared: 08/28/2007 1145 Analysis Batch: 360-22828 Prep Batch: 360-22625

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

Analyte Spike Amount Result % Rec. Limit Qual 85 - 115 Ammonia 10.0 9.46 95

Job Number: 360-11839-1 Client: Olin Corporation

Method Blank - Batch: 360-22719

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: MB 360-22719/1-A

Client Matrix: Water

Dilution:

1.0

Date Analyzed: 08/30/2007 1527 Date Prepared: 08/30/2007 0925 Analysis Batch: 360-22829 Prep Batch: 360-22719

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

Analyte Ammonia Result

Qual

RL

RL

0.10

0.10

Lab Control Spike - Batch: 360-22719

Method: 10-107-06-1

Preparation: Distill/Ammonia

Lab Sample ID: LCS 360-22719/2-A

Client Matrix: Water 1.0

Dilution:

Date Analyzed: 08/30/2007 1528

Date Prepared: 08/30/2007 0925

Analysis Batch: 360-22829 Prep Batch: 360-22719

Units: mg/L

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Initial Weight/Volume: mL

Final Weight/Volume: 50 mL

Analyte

Ammonia

Spike Amount

Result

% Rec.

Limit

Qual

10.0

9.50

95

85 - 115

Matrix Spike/

Matrix Spike Duplicate Recovery Report - Batch: 360-22719

Preparation: Distill/Ammonia

MS Lab Sample ID:

360-11839-1

Analysis Batch: 360-22829

Instrument ID: No Equipment Assigned

Client Matrix:

Water 1.0

Prep Batch: 360-22719

Lab File ID:

N/A mL

Initial Weight/Volume:

Method: 10-107-06-1

Date Analyzed: Date Prepared:

Dilution:

Dilution:

08/30/2007 1530

08/30/2007 0925

Final Weight/Volume:

50 mL

MSD Lab Sample ID: 360-11839-1

Client Matrix:

Water

1.0

Analysis Batch: 360-22829 Prep Batch: 360-22719

Instrument ID: No Equipment Assigned

Lab File ID: N/A

Date Analyzed: Date Prepared: 08/30/2007 1531

Initial Weight/Volume: mL Final Weight/Volume: 50 mL

08/30/2007 0925

MS

Limit

RPD

**RPD Limit** 

Ammonia

Analyte

87

MSD

75 - 125

MS Qual MSD Qual

Calculations are performed before rounding to avoid round-off errors in calculated results.

**TestAmerica Westfield** 

Page 36 of 41

Client: Olin Corporation

Job Number: 360-11839-1

Lab Control Spike - Batch: 360-22496

Method: SM 4500 H+ B Preparation: N/A

Lab Sample ID: LCS 360-22496/1

Client Matrix: Water

Dilution: 1.0 Date Analyzed: 08/23/2007 0751

Date Prepared: N/A

Analysis Batch: 360-22496

Prep Batch: N/A

Units: SU

Instrument ID: MAN-TECH Ion Plus

Lab File ID: Initial Weight/Volume: Final Weight/Volume:

mL

Analyte	Spike Amount	Result	% Rec.	Limit	Qual
pH	6.00	5.970	100	90 - 110	

Duplicate - Batch: 360-22496

Method: SM 4500 H+ B Preparation: N/A

Lab Sample ID: 360-11839-1

Client Matrix: Dilution:

Water 1.0

Date Analyzed: 08/23/2007 0812

Date Prepared: N/A

Analysis Batch: 360-22496

Prep Batch: N/A

Units: SU

Instrument ID: MAN-TECH Ion Plus Autoti

Lab File ID: N/A Initial Weight/Volume: Final Weight/Volume:

Analyte	Sample Result/Qual	Result	RPD	Limit	Qual
рН	5.96	6.020	1	20	"Standard Combines of San

#### VPH SAMPLE INFORMATION DATA

#### SAMPLE INFORMATION

Sample	ID: 11839-1		_ Bato	h#2	2516	_		
Matrix	X Aqueous	Soil	☐ Sediment	Other		unqui — na		
Containers	X Satisfactory	Broken	Leaking:		7 A			
2 -	Aqueous (acid Preserved)	□ N/A	☑ pH<2	☐ pH>2	Comment:	- 1		
	Aqueous (TSP Preserved)	□ N/A	☐ pH<11	☐ pH>11	Comment:			
Sample Preservatives	Soil or	☐ N/A container	[선생님] [[[[[] [[] [[] [[] [[] [[] [[] [] [[] [[] []					
Sediment			s rec'd in Methanol: ng soil/sediment	covering s	oil/sediment	1:1 +/-25%		
		☐ Samples	received in air-tight o	container:		Other:		
Temperature	Received on Ice	Received	at 4°C ± 2°C	X Other:	1.2°C			
Sample Matrix	ID: 11839-1-MS	Soil	Bato	h# 2	2516			
Containers	Aqueous     Satisfactory	Broken	Leaking:	Other				
Containers	Aqueous (acid Preserved)	□ N/A	☑ pH<2	☐ pH>2	Comment:			
	Aqueous (TSP Preserved)	□ N/A	☐ pH<11	☐ pH>11	Comment:	14		
Sample Preservatives	Soil or	N/A container	g Soil/sediment/ mL Methanol					
	Sediment	☐ Sample ☐ not cover	1:1 +/-25%					
		☐ Samples	Other:					
Temperature	Received on Ice		at 4°C ± 2°C	X Other:	1.2°C			
Sample	ID: 11839-1-MSD		Bato	sh#2	22516	_		
Matrix	X Aqueous	Soil	Sediment	Other				
Containers		Broken	Leaking:					
	Aqueous (acid Preserved)	□ N/A	☑ pH<2	☐ pH>2	Comment:			
	Aqueous (TSP Preserved)	□ N/A	☐ pH<11	☐ pH>11	Comment:	to the to		
Sample Preservatives	Soil or	☐ N/A container	☐ Samples NO	g Soil/sediment/ mL Methanol				
0.5	Sediment	1 1000 CH 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	s rec'd in Methanol: ing soil/sediment	1:1 +/-25%				
		☐ Samples	received in air-tight	container:		Other:		
Temperature	x Received on Ice		at 4°C ± 2°C	X Other:	1.2°C			



MADEP MA 014 RIDOH57 CTDPH 0494 NH DES 253903-A

NELAP FL E87912 TOX NELAP NJ MA008 TOX **NELAP NY 10843** NYDOH 10843



TestAmerica Westfield 53 Southampton Rd. Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707

Boston-Service Center 148 Rangeway Rd. N. Billerica, MA 01862 Tel:(978)667-1400 fax:(978)667-7871

WI-VOA-002.1 3/20/07

9/5/078:31 AM

#### **VPH SAMPLE INFORMATION DATA**

#### SAMPLE INFORMATION

Sample II	D: 11839-2		-	Bato	ch#	22	:516		
Matrix	X Aqueous	Soil	П	Sediment		Other		3 1	
Containers	✓ Satisfactory	Broken		Leaking:					
a . See Dept	Aqueous (acid Preserved)	□ N/A	X	pH<2		pH>2	Comment:	ie just gydi. Mei	
	Aqueous (TSP Preserved)	□ N/A		pH<11		pH>11	Comment:		
Sample Preservatives	Soil or	☐ N/A container		Samples NO	l preser	ved in Metha	anol or air-tight	g Soil/sediment mL Methanol	
	Sediment	The second secon	Samples rec'd in Methanol: Covering soil/se not covering soil/sediment					1:1 +/-25%	
3				ved in air-tight			4.000	☐ Other:	
Temperature	Received on Ice	Percivad	of Au	1 + 13.1	13/1	Other:	1.2°C		





MADEP MA 014 RIDOH57 CTDPH 0494 VT DECWSD NH DES 253903-A

NELAP FL E87912 TOX NELAP NJ MA008 TOX NELAP NY 10843 NYDOH 10843



TestAmerica Westfield 53 Southampton Rd. Westfield, MA 01085 Tel:(413)572-4000 Fax:(413)572-3707 Boston-Service Center 148 Rangeway Rd. N. Billerica, MA 01862 Tel:(978)667-1400 fax:(978)667-7871

#### LOGIN SAMPLE RECEIPT CHECK LIST

Client: Olin Corporation

Job Number: 360-11839-1

Login Number: 11839

Question	T/F/NA	Comment	
Radioactivity either was not measured or, if measured, is at or below background	NA		
The cooler's custody seal, if present, is intact.	NA		
The cooler or samples do not appear to have been compromised or tampered with	. True		
Samples were received on ice.	True		ă.
Cooler Temperature is acceptable.	True	1.2 C	
Cooler Temperature is recorded.	True		
COC is present.	True		
COC is filled out in ink and legible.	True		
COC is filled out with all pertinent information.	True		
There are no discrepancies between the sample IDs on the containers and the COC.	True		
Samples are received within Holding Time.	True		
Sample containers have legible labels.	True		
Containers are not broken or leaking.	True		
Sample collection date/times are provided.	True		
Appropriate sample containers are used.	True		
Sample bottles are completely filled.	True		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True		
VOA sample vials do not have headspace or bubble is <6mm (1/4") in diameter.	True		
If necessary, staff have been informed of any short hold time or quick TAT needs	True		
Multiphasic samples are not present.	True	2	
Samples do not require splitting or compositing.	True		

#### Severn Trent Laboratories, Inc. Chain of Custody Form

SEVERN ST

43239

•53 Southamoton Road Westfield, MA 01085 (P) 413-572-4000 (F) 413-572-3707

STL Westfield

■149 Rangeway Road N. Billerica, MA 01882 (P) 978-657-1400 (F) 978-667-7871

360-11839 STL Billerica / Service Center Project #: 63000600 Plant Blobs Client: MACTEC Shaded areas for office use Project Manager: Peter Thempson 107 Luduban Rd. Address: Comments Analysis Requested (Special Instructions) Suite 301, Water Field, MA Work ID: Check analysis and specify method Fax: (781) 245 and analytesin comments section. 01860 Contact: Pave charman Please print legibility. If the analytical For example: Regulatory Classification 500-series for Drinking water Requested Turnaround Time (PLEASE SPECIFY) Special Report Format requests are not clearly defined on the 600-series forwaste water, NPDES NPDES \_\_ Drinking Water QA/QC Report chain-of-custody, the turnaround time 6000-series ( groundwater, soil, waste 8000-series ( proundwater, soil, waste STANDARD X RCRA -- MCP GW1/S1 -DQE (MCP) Rpt . will begin after all questions have been Use comments section to further define. (Lab Approval Required) Other DEP Form(s) satisfactority answered. Sample Type Codes Preservative WW-Wastewater DW-Drinking water SW-Surface water / TOC GW-Groundwater LW-Lab water A-Air S-Solid / Soil SL-Sludge O-Oil Z-Other Date Time 12SO4 to pH NaOH to pH Sampler's Initials Collected Sample ID 8/21/0 GW 16 15:35 8/2110 GW-16 PUP 15:35 8/31/07 PLE 6w-16 MS 15:35 612110 GW-16MSD 15:35 Trip Blonk MADEP Requirement Sampled by (print): Cooler TYL N downed Chapma Samples Iced ( ) / N Received by: Time: Relinquished by: Time: Temp @ receipt: Received by: Time Relinquished by: 8/22 1630 Preservation / pH checked? 70 / N Received by: By: WAY Date: 8/22/07

Version 1.2, Nov 2002

Reviewer/Date	/11/	The	Mille	~ 11	plan
Sr. Review/Dat	e Chr	13 R	care	(. I	113/07
Lab Report #_	360-	1183	7-1	SARVICE	1 1
Project # 6 3	00060	001.6	1.1	2.71	

1.0	Laboratory Deliverable Requirements						
	1.1 Laboratory Information: Was all of the following provided in the lab			ė.		Comments:	
	☐ Name of Laboratory ☐ Address ☐ Project ID ☐ Client Information: ☐ Name ☐ Address	Phone #	☑ Samp ntact	ole identifica (IDs must be	tion – Field al e cross-refere	nd Laboratory enced)	
ACTI	ON: If no, contact lab for submission of missing or illegible information	ion.			* 1		3
	1.2 Laboratory Report Certification Statement		Yes [	No [_]	N/A [_]	Comments:	
Does t	the laboratory report include a completed Analytical Report Certification	in the required	format?				e 2 -
ACTIC	ON: If no, contact lab for submission of missing certification or certification	ion with correct	format.				ほ
	1.3 Laboratory Case Narrative:		Yes 🗾	No [_]	N/A [_]	Comments:	
Ø.	Narrative serves as an exception report for the project and method QA/QC p	performance.	D Narrativ		an explanatio n Statement.	n of each discre	epancy on the
ACTIC	ON: If no, contact lab for submission of missing or illegible information.	2					
	1.4 Chain of Custody (COC) copy present of completed COC?		Yes [	No [_]	N/A [_]	Comments:	
Does tl	ne laboratory report include a copy of the completed Chain of Custody form samples in this SDG?	s containing all		A L			
NOTE	: Olin receives and maintains the original COC.		4.				
ACTIO	ON: If no, contact lab for submission of missing completed COC.						

1.5 Sa tasks c	mple Recei ompleted an	pt Information (Cooler Receipt of the samp	Form): Were each of le(s) into the laboratory	the following	Yes 🗾	/ No [_]	N/A [_]	Comments:		
☐ Sample temp	erature conf	irmed: must be 1° - 10° C. (If sampl	es were sent by courier	and delivered	l on the same	day as colle	ection, temper	ature requirement	does not apply	).
		Condition observed pH verified								
ACTION: If no	o, contact lab	o for submission of missing or incom	plete documentation.	T = 3 = 3 =		a an				
1.5.1	Were the	correct bottles and preservatives	s used?	234- 1 20-	Yes 🔟	No [	N/A []	Comments:		*
		Liter amber bottle/cool to 4°C oz soil jar/cool to 4°C							*	
container/vo	lume (if a	form senior chemist. Docume pplicable), qualify positive and °C. Rejection of data requires pr	d non-detect data (.	J) if cooler			,			
1.5.2	Were all sa	mples delivered to the laboratory wi	thout breakage?		Yes 🔼	No [_]	N/A []	Comments:		
1.5.3	sample re	Cooler Receipt Form or Lab Narr eccipt, condition of the samples nees affecting the quality of the data?	, analytical problems		Yes []	No Le	N/A [_]	Comments:		
	ample Resu	Its Section: Was the following info sample?	ormation supplied in th	he laboratory	Yes 🔽	No [_]	N/A [_]	Comments:		,
E Eield ID and Clean-up me		Date and time collected Analysis method Target analytes and concentrati	Apalyst Inition Preparation			preparation/e		moisture or solids estion clean-up an t)		Reporting limits ere applicable
ACTION: If no	o, contact lat	o for submission of missing or incom	plete information.	į						

1.7 QA/QC Information: Was the following information provided in the lab for each sample batch?	
Method blank results LCS recoveries MS/MSD recoveries and RPDs	La Surrogate recoveries
ACTION: If no, contact lab for submission of missing or incomplete information.	
2.0 <u>Holding Times</u>	Yes No No N/A Comments:
Have any technical holding times, determined from date of collection to dat	e of analysis, been exceeded?
<b>NOTE:</b> For water samples, the holding time is 7 days from sampling to extraction sampling to extraction and 40 days from extraction to analysis.	on and 40 days from extraction to analysis. For soil samples, the holding time is 14 days from
ACTION: If technical holding times are exceeded, qualify all positive results (J) and detect results. For soil samples professional judgement will be used to determine if reje	
3.0 <u>Laboratory Method</u>	Yes No N/A Comments:
3.1 Was the correct laboratory method used?	
Water Extraction 3510C or 3520C Soil Extraction 3540C or 3550B Semi-volatile Organics 8270C	
compared to the requested method.	st variance from Client; contact laboratory to provide justification for method change
3.2 Are the practical quantitation limits the same as those special SOW GAPP Lab?  NOTE: The QAPP and MADEP QA/QC Guidelines provides PQLs for semi-vo compounds. Verify proper PQLs were used for each data set.	ified by the  Yes No No NA Comments:
ACTION: If no, evaluate change with respect to sample matrix, preparation, dilution, r	moisture, etc. If sample PQL is indeterminate, contact lab for explanation.
	2 1472

	C 10: 12: 12: 12: 12: 12: 12: 12: 12: 12: 12								************	
	3.3	Are the appropriate parameter results present for each sample in the S	DG?	Yes 🔟	No [_]	N/A []	Comments:			
								95.7 <sup>17</sup>	W	
ACT	ON: If no	o, check Request for Analysis to verify if method was ordered and COC	to verify that i	t was sent, ar	nd contact la	b for resubm	ission of the miss	ing data		
	3.4	Were Tentatively Identified Compounds (TICs) reported?	v.	Yes []	No [	N/A [_]	Comments:			×
are gui rep	required dance, T orted as	are only required for samples with full MADEP target list. Deter I. MADEP requires that all TICs be reported to the LCS. Per TICs, which are identified as aliphatic hydrocarbons, do not TICs. However, these compounds must be evaluated as part of ssessment approach (VPH/EPH).	the MADEP have to be		* u			is (ex		
AC	TION: Qu	ualify reported TIC results as estimated and flag (NJ).				17		Þ		
	3.5	If dilutions were required, were dilution factors reported?		Yes [	No [	N/A [_]	Comments:			
ACTI	ON: If no	, contact the lab for submission.							F 2	
4.0	Metho	od Blanks								
AC	4.1 TION: 1	Is the Method Blank Summary present?  If no, call the laboratory for submission of missing data.		Yes 🗾	No [_]	N/A []	Comments:			
	4.2	For the analysis of SVOCs, has a method blank been analyzanalysis batch of field samples of 20 or less?	ed for each	Yes 🗸	No [_]	N/A []	Comments:			
	TION: ification.	If no, document discrepancy in case narrative and control Consult senior chemist for action needed.	act lab for							- Ki

	4.3 Is the method blank less than the PQL?	v / / v / v v v v v v	2
	: MADEP allows common laboratory contaminants (such as phthant at concentrations < 5x the PQL	Yes No NA Comments:	
	4.4 Do any method blanks have positive results for SVOC parameters? according to the following:	Yes   No   N/A   Comments:	
	For the common contaminants (phthalates):	Bis (2-ethy/hexy/) phthalate	is reported in
	For the common contaminants (phthalates):  If the sample concentration is < 10 × blank value, flag sample result non-detect PQL or the concentration reported if greater than the PQL.	at ten times the blank conc.	imit was established
	If the sample concentration is $> 10 \times$ blank value, no qualification is needed.	bis (3-etly (hery)) phthelate in s	unles Gwile an
	For other SVOC contaminants:	GW16 OUP are less than the a	chem limit and
	If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect PQL or the concentration reported if greater than the PQL.		
	If the sample concentration is $> 5 \times$ blank value, no qualification is needed.	reporting Gmit.	P
	N: For any blank with positive results, list all contaminants for each x or 10x the blank value) and the associated samples and qualifiers.	n method blank, including the concentration detected and the	flagging level (flagging
0	Laboratory Control Standard		
	5.1 Was a laboratory control standard run with each analytical samples or less?	batch of 20 Yes No No N/A Comments:	
ACTI	가는 1000 - 그런데, 2004년 대회에 대회에 <b>에</b> 를 하면서, 인터스트를 보고했다는 그렇게 하는 사람이 있습니다. 그렇는 1000년 글래티를 했다면 기계하다. 그것은		
profes batch.	sional judgment to determine the usability of sample results associate	ed with that	

				<u> </u>			10
5.2	Is a LCS Summary Form present?	2	Yes 🔽	No [] N/A []	Comments:		114
ACTION:	If no, contact lab for resubmission of missing data.						
5.3	Is the recovery of any analyte outside of control limits?		Yes []	No N/A	Comments:		
NOTE: A fu	Il target, second source LCS is required by MADEP.					22	
	DEP guidelines list LCS recovery limits as 40-140 for base-neutral content and compounds. The laboratory must identify analytes that routinely						
5.4	thin the batch as (J). If LCS recovery is <10%, non-detect results are reasonable.  Are 80% of LCS recoveries within laboratory control limits?		Yes [ u/	No [] N/A []	Comments:		
ACTION:	If 80% of LCS recoveries are not within limits, use profession	nal indoment	I es L	NO N/A	Comments.		
	Senior Chemist.	iai juoginoin					
			*				
		9		* 1			
6.0 <u>Matri</u>	x Spikes	2 -		, i			
and the second s	may be collected at different frequencies based on monthly, chedules. Confirm spike requirements for each set with the sen		* ************************************				
1							

		SERVICE ON GRAN (TOS DT.	(IEIIIOD 02/00/020		
6.1 were	Were project specified MS/MSDs collected?	List project samples that	Yes No No N/A	Comments: Sample MS/NSD analysis.	Gu
ACTION: 1	f no, contact senior chemist to see if any were specified.	iA <sub>s</sub>	was submitted for	MS/NSD andyiù.	3
6.2	Is the MS/MSD recovery form present?  If no, contact lab for resubmission of missing data		Yes No No N/A	a p	
ACTION.	in no, contact tao tor resummission of missing date				
6.3	Were matrix spikes analyzed at the require samples per matrix?	d frequency of 1 per 20	Yes No No N/A	] Comments:	£
ACTION:	If any matrix spike data are missing, call lab for re	esubmission.			
					2
	4	8 4		* 9x	
		an a v			

6.4 Are any SVOC spike recoveries outside of the QC limits?

**NOTE:**  $%R = (SSR-SR) \times 100\%$ 

Where: SSR = Spiked sample result

SR = Sample result

SA = Spike added

NOTE: A full target, second source MS/MSD is required by MADEP.

NOTE: MADEP guidelines list MS/MSD recovery limits as 40-140 for base-neutral compounds and 30-130 for acid compounds.

NOTES: 1) If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags.

2) If the MS/MSD was performed by the laboratory on a non-project sample, no qualification is required.

ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify both positive results and non-detects (J). If LCS recovery is <10%, non-detect results are rejected (R).

Yes [ No [ N/A [ ] Comments: The MSD

per cent recovery for n-nitrosodiphrykmine
(-20) is less than the lover QC limit of 46

The result for n-nitrosodiphryamine in

sayles Gwite and Gwi6 Dup were

qualified estimated (J).

\* then appears to be an anomaly with the Ms/msD Runs. This may be due to a lab records ever, or lab handling ever. Results will be qualified estimated, but no mayor data quality concerns. LCS runs look good.

OR CONCERNS. LCS runs look good.

6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits?

**NOTE:** RPD = S-D x 100%

Where: S = MS sample result

D = MSD sample result

NOTE: MADEP guidelines list MS/MSD RPD limits for water as  $\leq$  20 and soils as  $\leq$  30.

**NOTE:** Laboratory control limits apply when spiked sample results fall within the normal calibration range. If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied.

**ACTION:** If the RPD exceeds the control limit, qualify positive results and non-detects (J).

Yes No N/A Comments:

The FPO for n-nitrosodi phenylamine exceeds the QC limit. Results were quelifil previously ember the us/uso percent necovey critura.

#### 7.0 Surrogate Recoveries

Were one or more SVOC surrogate recoveries outside of laboratory limits for any sample or method blank? If yes, were samples re-analyzed?

**NOTE**:  $%R = QD \times 100\%$ 

Where: S = MS sample result

D = MSD sample result

NOTE: MADEP guidelines list surrogate limits for soils as 30-130% for all surrogates, and for water as 30-130% for base-neutrals and 15-110% for acid surrogates.

NOTE: Qualify BNE results based upon BNE surrogates and AE results based upon AE surrogates.

ACTION: If recoveries are >10%, but 2 or more from any one fraction (acid or base-neutral) fail to meet QC criteria: (1) For recoveries below the QC limit, qualify non-detects and positives (J), and (2) For recoveries above the QC limit, qualify only positives (J). If any surrogate recovery is <10% (unless the lab QC limits are below

Yes No N/A Comments:

2,4,6-tribromophend (111, 196, and 171)
excell the OC limit of 110.
Phenol-ds (14,11, 12, and 12) are (ers
than the contol Gruit of 15. Aid
fraction analytes are not reported;
no further action required.

#### OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST SEMI-VOLATILE ORGAINICS BY METHOD 8270C/625

10%, in which case, results are flagged as stated above), flag positives (J) and reject non-detects (R). 8.0 Sampling Accuracy The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected. 8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the project chemist. NOTE: MADEP does not specify the collection of rinsate blanks. 8.2 Do any rinsate blanks have positive results? NOTE: For the common contaminants (phthalates), qualification is applied as indicated above using a 10x blank value in lieu of a 5x blank value. If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL. If the sample concentration is > 5 × blank value, no qualification is needed. 9.0 **Field Duplicates** 9.1 Were field duplicate samples collected? Obtain a list of the samples and their associated field duplicates. GW 16 and GWILL DUP 9.2 Were field duplicates collected per the required frequency? QAPP 

MADEP Option 1(1 per 20) 

MADEP Option 3 (1 per 10) 9.3 Was the RPD ≤ 50% for soils or waters? Calculate the RPD for all results and n-nitroso diphing I amine

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# OLIN-WILMINGTON LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST SEMI-VOLATILE ORGAINICS BY METHOD 8270C/625

	attach to this review.	
ACTI	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%.	120
10.0	Application of Validation Qualifiers	
	Was any of the data qualified?  Yes No NA Comments	<b>s</b>
	If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.	
REFE	CRENCES	*
LAW,	1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Envir GA 30144. August 1999.	conmental Services, Kennesaw,
STL-W	Vestfield, 2002. "Olin - General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield,	MA, 01085.

U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines For Evaluating Environmental Analyses"; Quality Assurance

"Massachusetts Quality Assurance / Quality Control (QA / QC

Unit Staff: Office of Environmental Measurement and Evaluation: December 1996

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup,

Requirements," BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.

MUNICIPALL 1.01 NINE COLOR	114	UIL
Sr. Review/Date Chiks Kicandi	11)	13/07
Lab Report # 360 - 11839-1	- 1	
Project # 6300060011.6/.1		

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

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	not define criteria, QASQC requirements with decidant to minds employed by the indocatory.	
1.0	Laboratory Deliverable Requirements	
1.0	Laboratory Denverable Requirements	
	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes No NA Comments:	
	Name of Laboratory Address Project ID Phone # Sample Identification – Field and Laboratory	
	Client Information:	
ACTIO	ON: If no, contact lab for submission of missing or illegible information.	
	1.2 Laboratory Report Certification Statement  Yes [ No [ N/A [ ] Comments:	
	Does the laboratory report include a completed Analytical Report Certification in the required format?	
ACTIO	N: If no, contact lab for submission of missing certification or certification with correct format.	
	1.3 Laboratory Case Narrative:  Yes [ No [ ] N/A [ ] Comments:	
	Narrative serves as an exception report for the project and method QA/QC performance. Narrative includes an explanation of each discrepancy on the	1e
	Certification Statement.	
ACTIO	N: If no, contact lab for submission of missing or illegible information.	
	1.4 Chain of Custody (COC) copy present with all documentation completed?  Yes No No NA Comments:	
	Does the laboratory report include completed Chain of Custody forms containing all samples in this SDG?	1.0
NOTE:	Olin receives and maintains the original COC.	
	N: If no, contact lab for submission of copy of completed COC.	
	1.5 Sample Receipt Information (Cooler Receipt Form present?):	

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				/	E			
			Yes	S NO NO	N/A []	Comments:		
Were each of the following	tasks completed and recorded upo	n receipt of the sample(s) into	the laboratory?					
Sample temperature con	firmed; must be 1° - 10° C. (If san	ples were sent by courier and	delivered on the	same day as colle	ction, temperate	re requirement de	oes not apply).	
Container type noted	Condition observed Field	and lab IDs cross referenced			17			
ACTION: If no, contact la	b for submission of missing or inco	omplete documentation.						
1.5.1 Were the c	orrect bottles and preservatives	used?		/	1121 4			
Soil - preserva field pre	40 mL VOA vial/HCL to pH<2 5 gram Encore <sup>TM</sup> /cool to 4°C ation of sodium bisulfate (low-eservation in water if soils are conditions, excessive humic ac	or 40 mL VOA vial w -level) or methanol (high- e reactive to sodium bisul	level) or	i [⊿/ No [	N/A 📋	Comments:		
ACTION: If no, inform cooler temperature exceed	n senior chemist. Document justeds 10°C. Rejection of data requ	stification for change in co uires professional judgmen	ntainer/volume t	e (if applicable)	qualify both	positive data an	d non-detect d	ata (J) if
ACTION: If each VOA	vial for a sample contains air b	ubbles or the VOA vial and	alyzed containe	ed air bubbles, fl	ag positives (J	) and reject non	detects (R).	
				. /	37/4 [ ]	C	i.	543
	ples delivered to the laboratory wi	A	Yes	No [	N/A [_]	Comments:		N 22
1.5.3 Does the Correceipt, condition quality of the data	oler Receipt Form or Lab Narrativ of the samples, analytical problem?	ve indicate other problems wi s or special circumstances aff	th sample ecting the Yes	L No Ld	N/A [_]	Comments:	**************************************	* 0
1.6 Sample Res	rults Section: Was the following h sample?	information supplied in the I	aboratory Yes	☑ No□	N/A [_]	Comments:		, = 3 A
☑ Field ID and Lab ID ☐ Clean-up method ☐ Matrix	Date and time collected Analysis method Target analytes and concentr	A palyst Initials  A party of Initials  A party of Initials  A party of Initials	Dilution F Date of pre Units (soil	Factor Zi eparation/extraction is must be reported	moisture or n/digestion clear		Reporting limits , where applicat	
ACTION: If no, contact la	b for submission of missing or inco	omplete information.					-	
1.7 QA/QC Infor for each sample ba	mation: Was the following inform	nation provided in the laborate	ory report Yes	✓ No □	N/A [_]	Comments:		
								1

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# LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST

	VOLATILE ORGANIC CO	OMPOUNDS B	Y METHOD 8	260B/624				
₪ M	ethod blank results	Surrogate r	ecoveries	e Th			9	1801
ACT	ION: If no, contact lab for submission of missing or incomplete information.			la se			8 °	
2.0	Holding Times		- 1 No 40		/		12 43	x >
	Have any technical holding times, determined from date of collection to d been exceeded?	ate of analysis,	Yes [ ] N	10 🗾	N/A]	Comments:		
	For water samples, the holding time is 7 days (aromatics) from unpreserved samples and 14 days for preserved samples.	sampling for					3	
	For soil samples, the holding time is 14 days from sampling if field p sodium bisulfate/methanol/or water. If an Encore™ sampler was used <i>preserve</i> the sample within 48 hours. Analytical holding time preservation is 14 days.	I, the lab must		*			# # # # # # # # # # # # # # # # # # #	S .
NOT	E: List samples that exceed hold time with # of days exceeded on checklist							*
ACTI detect	ION: If technical holding times are exceeded, qualify all positive results (J) and results. For soil samples professional judgement will be used to determine if rejulational forms of the control of the	non-detects (UJ ection is necessa	). For water san	oples that a	are grossly ex	xceeded (>2X h	old time) reject (	(R) all non-
	3.1 Was the correct laboratory method used?  Purge and Trap Water: 5030B Soil: 5035  Volatile Organics 8260B		Yes N	lo [_]	N/A [_]	Comments:		30 T
		the says				d:		lanas
ACTI	ON: If no, contact lab to provide justification for method change compared to the	e requested meti	od, Contact sen	ior chemis	t to inform C	nent of change of	or to request van	iance.
2	3.2 Are the practical quantitation limits the same as those specified by the SOW DOAPP DLab MADEP	2.2	Yes N	[• [_]	N/A [_]	Comments:		
Evalua that ar	ate PQLs with respect to sample matrix, preparation, dilution, moisture, etc. If same elevated due to dilution, sample matrix, or preparation factors.	mple PQL is ind	eterminate, cont	act lab for	explanation.	Provide a listin	g of all samples	with PQLs
				3.7				

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				# E2	/			
	3.3	Are the appropriate parameter results present for each sample in the SD	G?	Yes 🗸	No [_]	N/A [_]	Comments:	
					037038	7 6	41	UZ
NOT organ	E: The	e MADEP QA/QC Guidelines requires a minimum compound reporting I spounds. Determine target compound requirement and verify reporting list.	list for volatile			V * *		
	3.4	Were Tentatively Identified Compounds (TICs) reported?		Yes [_]	No [	N/A [_]	Comments:	
are i guida as Ti	equire ance, 1 ICs. H	Es are only required for samples with full MADEP target list. Deter ed. MADEP requires that all TICs be reported to the LCS. Per TICs, which are identified as aliphatic hydrocarbons, do not have to However, these compounds must be evaluated as part of the healt at approach (VPH/EPH).	the MADEP be reported					ж — ж.
40								
ACT	ION: G	Qualify reported TIC results as estimated and flag (NJ).			•			
	3.5	If dilutions were required, were dilution factors reported?		Yes 🗾	No [_]	N/A [_]	Comments:	
the la	E: MA aborato ach an	ADEP guidance states that if a diluted and an undiluted analysis is ory should report results for the lowest dilution within the valid calib alyte.	s performed, ration range	2 - V				
		The second of the second secon	A					*
CTIO	N: If n	o, contact the lab for submission.	3					2
.0	Meth	od Blanks						*
	4.1 A	re the Method Blank Summaries present?	2 8 7 8	Yes [	No [_]	N/A 📋	Comments:	
			3					
CTIO	N: If r	no, call the laboratory for submission of missing data.	p # "	1				
	4.2 W	as a method blank analyzed for each analytical batch of 20 samples or	r less?	Yes 🗸	No [_]	N/A [_]	Comments:	
			8 9	×				ejtur.
			. 2.0					. 7.7

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ACTIO	ON: If no, document discrepancy in case narrative and contact lab for justification	on. Consult sen	ior chemist f	or action nee	eded.	9	E V	
	4.3 Is the method blank less than the PQL? (See attached table for PQLs).		Yes 🗸	No [_]	N/A []	Comments:	* ***	
	TE: MADEP allows common laboratory contaminants (acetone, methy 2-butanone) to be present at concentrations < 5x the PQL.	viene chloride						
	4.4 Do any method blanks have positive results for VOC parameters? according to the following:	Qualify data	Yes [_]	No 🗹	N/A [_]	Comments:	± "	8
	For the common contaminants (methylene chloride, acetone, toluene, abutanone):	and 2-	ş.					
	If the sample concentration is $< 10 \times$ blank value, flag sample result non-detect PQL or the concentration reported if greater than the PQL.	t "U" at the		= "   T	jt.			
	If the sample concentration is $> 10 \times$ blank value, no qualification is needed.							
	For other VOC contaminants:						* * *	100
	If the sample concentration is $< 5 \times$ blank value, flag sample result non-detect PQL or the concentration reported if greater than the PQL.	"U" at the		ger e	+7		∰ # ≅	
	If the sample concentration is $> 5 \times$ blank value, no qualification is needed.							
ACTION THE PROPERTY IN THE PRO	ON: If any blank has positive results, list all the concentrations detected and flag alifiers.	gging level (flag	ging level =	10x or 5 × b	lank value) or	n the checklist.	List all affected s	amples and
		# ** · · ·			(6)		in a	
5.0	Laboratory Control Standards	<u> </u>	*: :	/			te te	
	5.1 Was a laboratory control standard (LCS) run with each analytical samples or less?	l batch of 20	Yes 🗗	No [_]	N/A [_]	Comments:	n s	
ACTIC udgme	N: If no, call laboratory for LCS form submittal. If data is not available, us not to determine qualification actions for data associated with that batch.	e professional		, C		E Little		
						- w	-	

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		25		3 1				
5.2	Is a LCS Summary Form present?		Yes 🗹	No [_]	N/A [_]	Comments:		2000 A - 20
ACTION: If no	o, contact lab for resubmission of missing data.							
5.2	Is the recovery of any analyte outside of control limits?		Yes [_]	No Le	N/A [_]	Comments:		2.
NOTE: A ful	II target, second source LCS is required by MADEP.					The second		
NOTE: Use	MADEP guidelines list LCS recovery limits of 70-130.	B					> 100	
ACTION: If r	ecovery is above the upper limit, qualify all positive sample results thin the batch as (J). If LCS recovery is <10%, non-detect results are	within the batch a e rejected (R). Do	s (J). If reco	overy is belo ified compou	w the lower l nds and perce	imit but > 10%, ent recoveries in	qualify all po	sitive and n report.
22				_				3
5.4 Ar	e 80% of LCS recoveries within laboratory control limits?		Yes 🔟	No [_]	N/A [_]	Comments:	B1	*
	If 80% of LCS recoveries are not within limits, use profess Senior Chemist.	ional judgment				, E 5*		#
				5.0				
6.0 Matrix	Spikes							, to
Matrix spikes senior chemist.	may be collected at different frequencies based on monthly,	quarterly, or ta	sk specific	schedules.	Confirm sp	oike requireme	nts for each	set with th
6.1	Were project-specific MS/MSDs collected? List project samples th	at were spiked.	/				c 10	61/116
ACTION: If no.	, contact senior chemist to see if any were specified.		Yes 🗾	No [	N/A [_]	Comments:	Sample	GWID
6.2	Is the MS/MSD Recovery Form present?	Con Maria	was	jubrusi Hel	tor w	Comments:	4871.	
	o, contact lab for resubmission of missing data.		Yes 🔽	No [_]	N/A []	Comments:	105	9
6.3	Were matrix spikes analyzed at the required frequency of 1 per matrix?	20 samples per	Yes 🗸	No [_]	N/A [_]	Comments:		
ACTION: If an	y matrix spike data is missing, call lab for resubmission.	P H						
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		VOLATILE ORGANIC COMPOUN	DS BY METHOD 8260B/62	4	
6.4	Are any VOC spike recoveries outside	de of the QC limits?		BC 277 E	
	, ,	2 No.	Yes No No		s: The 2,4,4-
	NOTE NE (GGD GD) - 1009/	Wilson COD - Collect accords records	Trimethy 1-1-pe	ntere MS pe	rente recovery or QC limit of
	NOTE: $%R = (SSR-SR) \times 100\%$ SA	Where: SSR = Spiked sample result SR = Sample result	(G5) is less	then the low	or QC limit of
		SA = Spike added		The second secon	3
			8		
NOTE: A fu	ull target, second source MS/MSD is	required by MADEP.			
NOTE: MA	DEP guidelines list MS/MSD recover	ry limits as 70-130.	¥		
NOTES: 1) 2) I	If only one of the recoveries for an MS/ f the MS/MSD was performed by the lab	MSD pair is outside of the control limits, no oratory on a non-project sample, no qualit	no qualification is necessary. I fication is required.	Jse professional judgment	for the MS/MSD flags.
ACTION: estimated (I	J). If the recoveries of the MS and	sample spiked. If the recoveries of MSD are lower than the lower control	the MS and MSD exceed I limit, qualify both positiv	the upper control limit e results and non-detect	t, qualify positive results as is (J). If recovery is < 10%
reject non-e	icicola (IC).		1 1 1 W 1 W 1		
		10.00			10.0
6.5 Ar	re any RPDs for MS/MSD recoveries ou	tside of the QA/QC limits?		4	s: The RPD
NOTE: RPI	$D = S - D \times 100\%  \text{Where S = M}$ $(S + D)/2  D = 1$	S result MSD result	Yes [ No [	N/A Comment	when (32) excee
NOTE: MA	DEP guidelines list MS/MSD RPD lin		for 2,4,4-	trinetly 1-1-p	where ( 52) excel
NOIE. WA	DEI galdemies hat mermes in 2 m	me for Bour page and come to	11. 01 1	1. L 30	The result for
ACTION: If	the RPD exceeds the control limit, of	qualify positive results and non-detects	(J).	my of so.	
		**************************************	211:11 1 sin of 1.	1- sentene	in samples Gui
			214,4- + 112014	1.1	1 1 110
		a	end GW16 DUP	were qualit	red estimated ()
				* .	
7.0 Surro	ogate Recoveries			<i>_</i> .	
Were	one or more VOC surrogate recov	eries outside of laboratory limits for	any Yes No No	N/A [_] Comments	3:
T	g saadi saasias saasi				
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sample or method blan	nk? If yes, were samples i	re-analyzed?			Si e	The state of the s	
<b>NOTE:</b> $%R = QD \times 100\%$	Where: $S = I$ D = MSD san	MS sample result nple result	n				F <sub>102</sub> 1
NOTE: No qualification is limits. If surrogate recoverie checklist and in the case name	es fail due to dilution, res				*		
NOTE: MADEP guidelines Surrogate recovery limits gr sludges, etc.) with approprie	reater than <u>+</u> 30% are allo	owed for difficult m <b>atri</b>	as 70-130%. ces (wastes,				
ACTION: If recoveries are > (2) For recoveries above the C flagged as stated above), flag p	C limit, qualify only posi	itives (J). If any surrog	) For recoverie gate recovery i	s below the QC lins <10% (unless the	mit but >10%, que QC limits are	ualify nondetects and po below 10%, in which o	ositives (J), and ease, results are
8.0 Sampling Accuracy			4				
8.1 Were trip blanks shipped NOTE: MADEP requires trip Soil/Sedimen	blanks per the following fi			Yes No No	] N/A[]	Comments:	
Option 1 Not Require Option 3 1 per 10 sar	AG .	1 per cooler VOAs/VI 1 per 10 samples	PH				
8.2 Do any trip blanks	have positive results?		7	Yes [_] No [_	N/A	Comments:	
ACTION: Prepare a list of sa	mples shipped in the same	cooler as a contamina	ited blank.	18			
		# S	7 + a.			# MI	
If the sample concentration is < 5	× blank value, flag sample re	sult non-detect "U" at the	PQL or the con	centration reported i	f greater than the l	PQL.	
If the sample concentration is > 5	× blank value, no qualificatio	n is needed.					

		(0)			- 100			
			2	4 5 3				
	najority of ground water samples are collected directly from a to	ap, process stream,	Yes [ ]	No [	N/A []	Comments:		
or wi	th dedicated tubing. Rinse blanks will not be collected.		100	2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	West,			
		that a Caller aggregated	*,					II gi
8.3 W	ere rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a samples from the senior chemist.	list of the associated						- 1
	samples from the semor elicities.						£1	
NO	TE: MADEP does not specify the collection of rinsate blanks.					9		
	8.4 Do any rinsate blanks have positive results?		Yes [ ]	No.f 1	N/A [ or	Comments		
			. I cs	110	IVA []	Commons.	.*	
		9, 4		12			C	35
ACTI	(ON: Evaluate rinsate results against blank results to determine ambient-, or shipment-related, qualify according to the table about	if contaminant may	y be labora	atory-, amb	ient-, or ship	oment-derived.	If results are	not lab-,
	And the second s					a 20		1.1 8
9.0	Field Duplicates							*11 a g
9.0	Fleiu Duplicates			/	4			9
	9.1 Were field duplicate samples collected? Obtain a list of samples	and their associated	Yes	No[]	N/A[]	Comments:	F	
	field duplicates.	A second				L GW16	DUS	
		and the contract		_ (-	.W16 a	m 0.50.0		
CE	9.2 Were field duplicates collected per the required frequency?	84	Feb. 1972			Comments:	RPD	1
	SOW ☐ QAPP (1 per 10) ☐ MADEP Option 1(1 per 20)		2,4	4 - Triv	uthy1-1	- pentene ·	16	8
8127			, , ,,	" Trin	461 - 2-	- sentene		
	MADEP Option 3 (1 per 10)		2,4,	4 - 170	-, -,	•	26	
	0.3 W. d. DDD 4 50% for sails as 20% for maters? Calculate the	PPD for all results	,			Comments:		81
	9.3 Was the RPD ≤ 50% for soils or 30% for waters? Calculate the land attach to this review.	(d D for an results	Yes 🔽	No	N/A	Comments:		
	and attach to this review.							¥.
ACTI	ON: Qualify data (J) for both sample results if the RPD goal is exc	ceeded.						
	## **	*						
				FIRE .			8	

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iers
ı

Was any of the data qualified?

/ .		Pa.
Yes [ No [ ]	N/A []	Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

#### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999.
- STL-Westfield, 2002. "Olin General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.
- U.S. Environmental Protection Agency (USEPA), 1996. "Region 1 EPA-NE Data Validation Guidelines For Evaluating Environmental Analyses"; Quality Assurance Unit Staff; Office of Environmental Measurement and Evaluation; December 1996.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance / Quality Control (QA / QC Requirements," BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance / Quality Control Guidelines for Sampling, Data Evaluation and reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

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TOTAL MODIFIED	Y: 111	seren	7/14/01
Sr. Review/Date	Chris	Kicardi	11/13/0
Lab Report # 3	60-11939	-1	17
Project # 63 C	00600//.	61.1	

ammonia	ph	1
	_	_

Note: The following analyses will be evaluated according to the "MADEP QA/QC Guidelines for Sampling, Data Evaluation and Reporting Activities." MADEP, however, may not list QA/QC criteria for every chemical analysis. Where not defined by MADEP, criteria will default to values stipulated in the QAPP. Where the QAPP does not define criteria, QA/QC requirements will default to limits employed by the laboratory.

1.0	Laboratory Deliverable Requirements	
	1.1 Laboratory Information: Was all of the following provided in the laboratory reporting the laboratory report in the la	rt? Yes No N/A Comments:  Sample identification – Field and Laboratory
	☐ Name of Laboratory ☐ Address ☐ Project ID ☐ Phone #  Client Information: ☐ Name ☐ Address ☐ Client Contact	(IDs must be cross-referenced)
ACT	ON: If no, contact lab for submission of missing or illegible information.	(IDS Must be closs-relevenced)
	1.2 Laboratory Report Certification Statement	
	The state of the s	Yes No No N/A Comments:
	Does the laboratory report include a completed Analytical Report Certification in the	ne required format?
ACTIO	ON: If no, contact lab for submission of missing certification or certification with corre	ct format.
	1.3 Laboratory Case Narrative:	Yes No No NA COmments:
	Narrative serves as an exception report for the project and method QA/QC performant	nce.   Narrative includes an explanation of each discrepancy on the
		Certification Statement.
ACTIO	DN: If no, contact lab for submission of missing or illegible information.	
	1.4 Chain of Custody (COC) copy present with all documentation completed?	Yes No No N/A Comments:
+1	Does the laboratory report include copies of Chain of Custody forms containing all samples	s in this SDG?
	NOTE: Olin receives and maintains the original COC.	
ACTIO	ON: If no, contact lab for submission of copy of missing completed COC.	

1.5 Sample Receipt Information (Cooler Receipt Form): Were each of the following

tasks completed and recorded upon receipt of the sample(s) into the laboratory?

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		Yes No No	N/A []	Comments:		
Sample temperature confirmed: must be 1° - 10° C, (If sam	ples were sent by courier and delivered of	on the same day as colle	ction, temperatur	re requirement doe	es not apply).	
Container type noted Condition observed pH verifi	ed (where applicable)  Field and lab I	Ds cross referenced				
ACTION: If no, contact lab for submission of missing or inco 1.5.1 Were the correct bottles and prese					H (44)	
Ammonia,- 1 Liter polyethylene/H <sub>2</sub> SO <sub>4</sub> to pH<	2,cool to 4°C	Yes No No	N/A [_]	Comments:	2.4	
Oil & Grease - 1 Liter glass/HCL to pH<2,cool	to 4°C			E 10	g - v	140
Alkalinity – 1 Liter polyethylene/cool to 4°C					A	8 1 H.
Chemical Oxygen Demand – 50 mL polyethyler Chloride, pH, sulfate - 50 mL polyethylene/cool						12
Organic Carbon - 500 mL amber glass bottle/H	Cl or H <sub>2</sub> SO <sub>4</sub> to pH<2,cool to 4°C	38	* 1			
Sulfide – 50 mL polyethylene/ZnAcetate + NaC Specific conductance, TDS, TSS – 100 mL poly	OH to pH>9, cool to 4°C		0.00		# # **	
ACTION: If no, inform senior chemist. Documentainer/volume (if applicable), qualify positive and temperature exceeds 10°C. Rejection of data requires presented to the contract of the contrac	non-detect data (J) data if cooler				No.	
1.5.2 Were all samples delivered to the laborated to the	oratory without breakage?	Yes No No	N/A []	Comments:	20 27 2 28 20 30 20	
	Narrative indicate other problems with mples, analytical problems or special the data?	Yes No No	N/A [_]	Comments:		

								31.42
1.6 Sample Res		e following information so	upplied in the labora		o [_] N/A [_]	Comments:	E . 9	
							<i>a.</i>	a j
Field ID and Lab ID	Date and time  Analysis method	collected Ar	nalyst Initials	Dilution Factor	or 2 % n	noisture or solids an-up and analysis,	Reporti	ing limits
Matrix	Target analytes a	nd concentrations		Units (soils must be re				
ACTION: If no, contact la	ab for submission of mi	ssing or incomplete inform		\$ I				
		•					(40)	
1.7.04/0C Info		wing information provide	1: 1 11			40,71		
for each sample ba	mation: was the followitch?	wing information provide	in the laboratory rej	oort Yes No	N/A [	Comments:		
	1	7				*		100
Method blank results	☑ LCS recoveries ☑	MS/MSD recoveries an	ADDD Takens	dlitlt- /	mhana amuliashla)			
a intention plants testins	El LCS lecoveries E	I MS/MSD recoveries an	d RPDs Laborat	ory duplicate results (	where applicable)		N 4	
ACTION: If no, contact lab	b for submission of mis	sing or incomplete inform	ation.	0.1	. et			
	74.0			1 2 1 2			No. T	
			24				160 15	
			w <sub>a</sub> , is				5 0	- 33
2.0 <u>Holding Times</u>			N <sub>att</sub> 18	Yes [V] No	N/A _]	Comments: The	u samples u	ver
Have any technica	I holding times determ	nined from date of collect	ion to data of analysi	s heen evceeded? T	he holding times are	received as follows:	by the w	b one
20 1	nording times, determ	and an and all all all		s, occir exceeded? I	tenes total amounts	as ionows. duy	after sun	yple coll
28 days = an	imonia, chemical oxyg	gen demand, chioride, org	anic carbon, oil & gr	ease, specific conduc	tance, total organic of	carbon and sulfate		
Alkalinity =	14 days	Sulfide, TDS, TSS =	7 days pH	= analyze immediatel	ly Nitrate	e nitrogen as N = 48	8 hrs	Lale.
Nitrite nitrog	gen as $N = 48$ hrs	Nitrate + Nitrite as N	I = 28 days		The lab a	myzel pH T	no very	1310-
NOTE: List sample	es that exceed hold tim	e with # of days exceeded	on checklist		The lab a hold time.	the results =	to pH wer	e quality
ACTION: If technical hol udgment used to qualify soil		ed qualify results (J). For	water samples that a	are grossly exceeded	(>2X hold time) rej est; mated	ect (R) all non-dete	ect results. Profe	essional
3.0 Laborator	y Method			Yes [ No	N/A	Comments:		
			00 %					14

3.1 Was the correct laboratory method used?

ACTION: If no, contact lab to provide justification for method change compared to the requested method. Contact senior chemist to inform Client of change or to request variance.

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		limits the same as those spe	cified by the Yes	No [] N/A []	Comments:	8 S J
¥11	Note: The MADEP QA/QC Guidelines therefore all criteria will default to values	Lab?  do not yet list PQLs for wet chem stimulated in the OARB* Where the	istry analyses,		18 18	
	define criteria, QA/QC requirements del may also apply				22	
	Ammonia* ☑ = 0.1 mg/ L	Alkalinity**□ = 1 mg/L	Bicarbonate Alk	alinity** □ = 1 mg/L	Carbonate Alkalia	nity** □ = 1 mg/L
	Nitrate Nitrogen as N* □ = .05 mg/L	Nitrite Nitrogen as N* □ = .01	ng/L Chloride* □ = 1	l mg/L	Hardness *□ = 2	. mg/L
	Spec. Cond.** □ 3 umhos/cm	Total Organic Carbon** □ = 1	mg/L Oil & Grease*	$\square = 3 \text{ mg/L}$	Sulfate (EPA 3	300.0)* □ = 2 mg/L
	COD:* / Low - 20 mg/L	COD* High - 50 mg/L □	TDS* □ = 10 n	ng/L	TSS* □ = 5 mg/	L ,
	pH*-22 < 2 to > 12					
	Other parameter(list)	PQL =	☐ Source of PQL =			
	Other parameter(list)	PQL =	☐ Source of PQL =			
ACTI	3.3 Are the appropriate parameter results  ON: If no, check Request for Analysis to ve			No [_] N/A [_]  contact lab for resubmiss		
	3.4 If dilutions were required, were dilution	on factors reported?	Yes	No [ N/A [	Comments:	£
ACTI	ON: If no, contact the lab for submission.					,
4.0	Method Blanks		Yes 🖊	No N/A	Comments:	110 20 H
	4.1 Are the Method Blank Summaries pro	esent?	( - 1 - A			
ACTI	ON: If no, call the laboratory for submission	n of missing data.				
	4.2 Was a method blank analyzed for eac 20 or less?	ch analysis batch of wet chemistry fie	eld samples of Yes	No [] N/A []	Comments:	

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1.5									
ACTI	ON: If n	o, document discrepancy in case narrative and contact lab for justificati	ion. Consult sen	ior chemist f	or action nee	eded.			
	4.3 Is t	the method blank less than the PQL? (See Section 3.2 for PQLs).		Yes 📝	No [_]	N/A []	Comments:		
					,	/		,	
		o any method blanks have positive results for wet chemistry parameters ling to the following:	s? Qualify data	Yes []	No [	N/A [_]	Comments:	*	
		sample concentration is $< 5 \times$ blank value, flag sample result non-detector the concentration reported if greater than the PQL.	t "U" at the						
	If the s	sample concentration is > 5 × blank value, no qualification is needed.			* <sub>H</sub>	e N		1.	
ACTI qualific		any blank has positive results, list all the concentrations detected and fl	lagging level (fla	agging level	= 5 × blank	value) on the	checklist. List al	l affected samples	s and the
			10	19					
5.0	Labor	atory Control Standards							
	5.1	Was a laboratory control standard (LCS) run with each analytic samples or less?	al batch of 20	Yes 🔽	No [_]	N/A [_]	Comments:		
		to, call laboratory for LCS form submittal. If data is not available, usermine qualification actions for data associated with the batch.	se professional						
	5.2	Is a LCS Summary Form present?		Yes 📗	No [_]	N/A [_]	Comments:		
ACTIO	ON: If no	o, contact lab for resubmission of missing data.							
	5.3	Is any wet chamietry analyte I CS recovery outside the control limits	9	Vec [ ]	No.L.	N/A [ ]	Comments:		

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	98	1		* ×
		3		
CS L	imits:			X.
	Alkalinity** □ = 80-120%	Bicarbonate Alkalinity** □ = 80-120%	Carbonate Alkalinity** □ = 80-120%	Specific Conductivity *□ = 80-120%
	Total Organic Carbon** □ = 80-120%		' Oil & Grease* □ = 80-120%	Ammonia Nitrogen as N* □ = 80-120%
	COD Low* $\Box = 80-120\%$	COD High* $\square = 80-120\%$	Nitrate Nitrogen as N**□ = 85-115%	Nitrite Nitrogen as N** □= 75-120%
	Hardness* □ = 85-115%	Chloride* □ = 80-120%	Sulfate (EPA 300.0)* □ = 75-125%	$pH* \square = 98-102\%$ TSS* NA
58	Other parameter(list)	%R =	Rec Limits=	
	Other parameter(list)	%R =	☐ Rec Limits =	(e <sub>1</sub>
ACTIC vithin t	ON: If recovery is above the upper limit, the batch as (J). If LCS recovery is <10%,	qualify all positive sample results within the non-detect results are rejected (R).	e batch as (J). If recovery is below the lower li	mit, qualify all positive and no-detect result
, idaii ,	and dution as (b). If Does receively as 1070,	,		
.0	Matrix Spikes			
		1		
		requencies based on monthly, quarterly ents for each set with the senior chemist		# #
	6.1 Were project-specific MS/MSDs	s analyzed? List project samples that were s	piked.	Sunda GW16
CTIC	N: If no, contact senior chemist to see if a	any were specified.	Yes [V] No [] N/A []	Comments: Sample GW16 MS/MSD anlysis.
	6.2 Is the MS/MSD Recovery Form	m present?	was sobmitted to	my mer anagris.
CTIC	N: If no, contact lab for resubmission of	missing data.	Yes No NA	Comments:

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				2		
	6.3	Were matrix spikes analyzed matrix?	at the required frequency of 1 per 20 sa	Amples per Yes   No   1	N/A [ ] Comments	
ACTI	ON: If an	ny matrix spike data is missing, ca	ll lab for resubmission.	res No	TVA Comments	•
	6.4	Are any wet chemistry analyte s	spike recoveries outside of the QC limits?	Yes No No	N/A [_] Comments:	e e e e e e e e e e e e e e e e e e e
		NOTE: %R = (	(SSR-SR) x 100% SA = Spike added	WI	here: SSR =	Spiked sample result SR = Sample result
	MS/MS	SD Recovery Limits:		History and the second		
	Alkalin	uity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity* = NA	Ammonia* (LACHAT	r) 🗹 = 74-125%
	Chloride	le*(SM 4500 Cl) □= 77-116%	Specific Conductivity * = NA	Total Organic Carbon* = NA	$TDS^{**} = NA$	V V
	Oil & G	Grease* = NA	COD Low* □ = 61-142%	COD High* □ = 92-109%	Nitrate Nitrogen as N*	* □ = 75-119%
	Nitrite N	Nitrogen as N** □ = 68-136%	Hardness* □ = 70-130%	Sulfate (EPA 300.0)* □ = 75-125	5% pH* = NA	TSS* = NA
	Other pa	arameter(list)	% R = _	□ Rec L	Limits =	k=
	* = Lab	oratory Limits **=	Olin QAPP Limits (MADEP has not	t yet defined LCS recovery limits for	or wet chemistry analyse	es.)
	NOTES	S: 1) If only one of the recoveries 2) If the MS/MSD was perform	for an MS/MSD pair is outside of the cor ed by the laboratory on a non-project sam	ntrol limits, no qualification is necessantle, no qualification is required.	ary. Use professional judgi	ment for the MS/MSD flags.
qualify	positive re	esults as estimated (J). If the rec	le spiked. Do not evaluate if sample conc overies of the MS and MSD are lower the detect, the results are considered unusable	an the lower control limit but > 30%	eries of the MS and MSD e , qualify both positive resu	exceed the upper control limit, alts and non-detects (J). If the
ACTIO evaluat	ON: Labored, but no	ratory control limits apply when flags are applied.	spiked sample results fall within the norr	mal calibration range. If dilutions are	required due to high samp	ole concentrations, the data is
	6.5 Are	any RPDs for MS/MSD recoverie	es outside of the QA/QC limits?			
	NOTE:	$RPD = \frac{S - D}{(S + D)/2} \times 100\% \text{ W}$	There S = MS result D = MSD result	Yes No No	N/A [_] Comments:	**

9	MS/MSD RPD Limits:						6
	Alkalinity* = NA	Bicarbonate Alkalinity* = NA	Carbonate alkalinity*	= NA	Ammonia** (LA	CHAT) <b>□</b> = 8	%
	Chloride**(SM 4500 Cl) □ = 15%	Specific Conductivity * = NA	Total Organic Carbon'	* = NA	TDS** = NA To	otal Organic C	arbon* = NA
	COD Low** □ = 14%	COD High** □ = 16%	Nitrate Nitrogen as N	**□ 16%	Nitrite Nitrogen	as N** □ = 16	5%
	Oil & Grease* = NA	Hardness* = NA	Sulfate (EPA 300.0)*	□ = 10%	pH* = NA	TSS*	= NA
	Other parameter(list)		RPD =		RPD limit =	118	= #
	Other parameter(list)		RPD =		RPD limit =		
	* = Laboratory Limits	** = Olin QAPP Limits					
	(MADEP has not yet defined LC	S recovery limits for wet chemis	try analyses.)	* V			
7.0	Laboratory Duplicate						
	Are the RPDs for the laboratory d	uplicates <20% unless otherwise sp	pecified below? Yes [	N₀L	] N/A [_]	Comments:	
ACTI	ON: If the RPD is greater than specifi	ied limits, qualify all results for that	analyte as estimated (J).				
	Alkalinity* = 4% Bica	arbonate Alkalinity* = 4%	Carbonate alkalinity* = 4%	6	Oil & Grease* [	□ = 20%	
	pH* ☑ = 3% Spe	cific Conductivity *□ = 5%	TSS** □ = 6%		TDS** □ = 6%	0 1 = 1 = 1	185
					¥ 3		Ara, 5
8.0	Sampling Accuracy			W	¥.,		# 1 #0 #5 g
	najority of ground water samples a dedicated tubing. Rinse blanks wi		, process stream, or	- 2			
	8.1 Were rinsate blanks collected? associated samples from the senior	Prior to evaluating rinsate blank chemist.	s, obtain a list of the Yes [	No [	N/A []	Comments:	
	8.2 Do any rinsate blanks have posi	itive results?	Yes [	_] No [_	N/A	Comments:	

ACTION: Evaluate rinsate results vs. blank results to determine if contaminant may be laboratory-derived. If not lab-related, qualify according to the table below. If the sample concentration is < 5 × blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL. If the sample concentration is  $> 5 \times$  blank value, no qualification is needed. NOTE: MADEP does not require the collection of rinsate blanks. 9.0 **Field Duplicates** Yes No NA Comments: Samples
GW16 and GW16 DUP Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates. 9.2 Were field duplicates collected per the required frequency? QAPP ☐ MADEP Option 1(1 per 20) ☐ MADEP Option 3 (1 per 10) ☐ sow 9.3 Was the RPD ≤ 50% for soils or waters? Calculate the RPD for all results and RPD attach to this review. 0% ACTION: RPD must be ≤50% for soil and water. Qualify data (J) for both sample results if the RPD exceeds 50%. 1.28 Was any of the data qualified?

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

#### REFERENCES

LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999.

STL-Westfield, 2002. "Olin - General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

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ACTION: If no, contact lab for submission of missing original COC.

# OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST VOLATILE PETROLEUM HYDROCARBONS BY METHOD MADEP

Reviewer/Date	Notal Class datos
Sr. Review/Date	Chino Quandi 11/13/0
Lab Report #	
LAW Project #	6300060011.61.1

围		
1.0	Laboratory Deliverable Requirements	
	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes No No NA Comments:  Check items received.  Name of Laboratory  Address  Project ID  Phone #  Sample identification - Field and Laboratory	
	Client Information: \(\overline{\mathbb{Z}}\) Name \(\overline{\mathbb{Z}}\) Address \(\overline{\mathbb{Z}}\) Client Contact (IDs must be cross-referenced)	
ACT	<b>FION</b> : If no, contact lab for submission of missing or illegible information.	30. 14 300
	1.2 Laboratory Report Certification Statement  Yes [ ] No [ ] N/A [ ] Comments:	2.9
	Does the laboratory report include a completed Analytical Report Certification in the required format?	
ACTI	FION: If no, contact lab for submission of missing certification or certification with correct format.	
	1.3 Laboratory Case Narrative: Are both of the following statements true?  Yes [ No [ ] N/A [ ] Comments:	Stept with
	Narrative serves as an exception report for the project and method QA/QC performance. A Narrative includes an explanation of each discrepa	ncy on the
	Certification Statement.	
ACTIO	ION: If no, contact lab for submission of missing or illegible information.	
	1.4 Chain of Custody (COC) copy present with all documentation completed?  Yes No N/A Comments:	
	NOTE: Olin receives and maintains the original COC.	95

# OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST

## VOLATILE PETROLEUM HYDROCARBONS BY METHOD MADEP

				/				- 6		
		Receipt Form): Were each of the sample(s) into the laborator		Yes 🖊	No [_]	N/A [_]	Comments:	(32 (60 (1)	(40)	
Sample temperature con	firmed: must be 1° - 10° C.	(If samples were sent by courie	er and delivered o	n the same o	day as colle	ction, temper	ature requirement	does not ap	ply).	
Container type noted	Condition observed	pH verified (where applica	ble) 🗷 Field	and lab IDs	cross refere	enced				
ACTION: If no, contact la	ab for submission of missing	or incomplete documentation.				4				
1.5.1 Were the	correct bottles and preserv	atives used?	- 20	/					16	
Soil - preserv field pr	ation of sodium bisulfate	o 4°C or 40 mL VOA vi (low-level) or methanol (lils are reactive to sodium	nigh-level) or	Yes 🔼	No [_]	N/A [_]	Comments:	1 (1 (0)) 1 (1)	<i>l</i> ,	-
cooler temperature exce	eds 10°C. Rejection of da	nent justification for change ta requires professional jud	gment							(J) if
ACTION: If each VOA	vial for a sample contain	s air bubbles or the VOA vi			_			ondetects (	K).	
1.5.2 Were all sar	mples delivered to the laborat	ory without breakage?		Yes 🗾	No [_]	N/A []	Comments:		3	
	of the samples, analytical pr	larrative indicate other problem oblems or special circumstance	ns with sample es affecting the	Yes [	No Let	N/A [_]	Comments:	# # #		
1.6 Sample Res		owing information supplied in	the laboratory	Yes 🔼	No [_]	N/A []	Comments:		40	
Field ID and Lab ID Clean-up method  Matrix	Date and time coll Analysis method Target analytes and co	oncentrations	on method		reparation/	extraction/dig	moisture or solids estion clean-up and t)	s E nd analysis,	Reportii where ap	ng limits plicable
ACTION: If no contact	ah for submission of missing	or incomplete information		D1 57						

		8 8 2		/				
	1.7 QA/QC Information: Was the following information provided in the l for each sample batch?	laboratory repo	rt Yes 🔼	No [_]	N/A []	Comments:	ta	
/		NA	7.14					
ol N	MS/MSD recoveries MS/MSD recoveries and RPDs	TI I aborator	u dunlicata r	amilta (mihana a	mmliachla)	D / S		
0.2	reduce of the results and resu	Laborator	y dupiteate is	esuns (where s	ipplicable)	Surrogate re	ecovenes	
CT	TON: If no, contact lab for submission of missing or incomplete information.						106	
	and the same of th							
0	Halding Times							
.0	Holding Times				2		A S	
	Have any technical holding times, determined from date of collection to d been exceeded?	late of analysis,	Yes [_]	No L	N/A [_]	Comments:		
	For water samples, the holding time is 7 days from sampling for samples and 14 days for preserved samples.	unpreserved						
	For soil samples, the holding time is 14 days from sampling if five with sodium bisulfate/methanol/or water. If an Encore™ sampler lab must <i>preserve</i> the sample within 48 hours. Analytical holding ti of preservation is 14 days.	was used, the		¥				
тот	E: List samples that exceed hold time with # of days exceeded on checklist							
				2 R				
CT	ION: If technical holding times are exceeded, qualify all positive results (J) and	reject (R) all ne	on-detect res	ults.			3 × X	
.0	Laboratory Method			1				
	3.1 Was the correct laboratory method used?		Yes Ly	No [_]	N/A [_]	Comments:		
	Purge and Trap Water: 5030B Soil: 5035	25						
	Volatile Petroleum Hydrocarbons MADEP VPH 98-	1						
CT	ION: If no, contact lab to provide justification for method change compared to the	he requested me	thod. Contac	ct senior chemi	st to inform C	lient of change	or to request v	ariance.
		_ U		11, 40				

### OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION

## STANDARD OPERATING PROCEDURE AND CHECKLIST VOLATILE PETROLEUM HYDROCARBONS BY METHOD MADEP

		10		/		
	3.2 Are the practical quantitation limits the same as those specific SOW ☐ QAPP ☐ Lab ☐ MADEP?	ed by t	he Yes	No [_]	N/A [_]	Comments:
	NOTE: The MADEP QA/QC Guidelines provides PQLs for volatile hydrocarbons. See the attached table for a listing of MADEP PQLs vs. the PQLs QAPP.					
ACTI	ON: If no, evaluate change with respect to sample matrix, preparation, dilution, mo	oisture, etc	. If sample PQ	L is indeter	minate, conta	et lab for explanation.
		PA PA	/			
	3.3 Are the appropriate parameters results present for each sample in the SDG?	)	Yes 🔟	No [_]	N/A []	Comments:
	NOTE: The MADEP QA/QC Guidelines requires a minimum compound report volatile organic compounds. See the attached table for a listing of the MADE compound reporting list.	rting list fo P minimun	or m		*	
	3.4 If dilutions were required, were dilution factors reported?		Yes Li	No [	N/A [_]	Comments:
	NOTE: MADEP guidance states that if a diluted and an undiluted a performed, the laboratory should report results for the lowest dilution	analysis i within the	s e			
	valid calibration range for each analyte.	580				
ACTI	ON: If no, contact the lab for submission.		-			
1.0	Method Blanks			/		
	4.1 Are the Method Blank Summaries present?	4-	Yes 🗾	No []	N/A []	Comments:
CTI	ON: If no, call the laboratory for submission of missing data.					
						(II)
		. 7	134			

	200						
4.2 Was a method blank analyzed for each analytical batch of 20 samples of	or less?	Yes 🔟	No [_]	N/A [_]	Comments:	THE 1/20	(B) (E)
: If no, document discrepancy in case narrative and contact lab for justification	on. Consult se	nior chemist f	for action n	eeded.			E 181
4.3 Is the method blank less than the PQL? (See attached table for PQLs).		Yes 🕡	No [	N/A []	Comments:		
4.4 Do any method blanks have positive results for VPH parameters? according to the following:	Qualify data	Yes [_]	No 🕢	N/A	Comments:		E III
For VPH contaminants:							11.04
		2					
f the sample concentration is $> 5 \times$ blank value, no qualification is needed.					× *		
: If any blank has positive results, list all the concentrations detected and flag fiers.	gging level (fla	gging level =	10x or 5 ×	blank value)	on the checklist.	List all affec	cted samples a
Laboratory Control Standard							*8
.1 Was a laboratory control standard (LCS) run with each analy of 20 samples or less?	ytical batch	Yes 🔝	No [_]	N/A [_]	Comments:		£2
	t available,	<u> </u>	X				
.2 Is a LCS Summary Form present?		Yes 🗸	No [_]	N/A []	Comments:		
CTION: If no, contact lab for resubmission of missing data.							
terrore. If no, contact lab for resubmission of missing data.							
	4.3 Is the method blank less than the PQL? (See attached table for PQLs). 4.4 Do any method blanks have positive results for VPH parameters? according to the following:  For VPH contaminants: If the sample concentration is < 5 × blank value, flag sample result "U" If the sample concentration is > 5 × blank value, no qualification is needed. It: If any blank has positive results, list all the concentrations detected and flag fiers.  Laboratory Control Standard  3.1 Was a laboratory control standard (LCS) run with each analy of 20 samples or less?  ACTION: Call laboratory for LCS form submittal. If data are no eject (R) data associated with that batch.  2.2 Is a LCS Summary Form present?	4.3 Is the method blank less than the PQL? (See attached table for PQLs).  4.4 Do any method blanks have positive results for VPH parameters? Qualify data according to the following:  For VPH contaminants:  If the sample concentration is < 5 × blank value, flag sample result "U"  If the sample concentration is > 5 × blank value, no qualification is needed.  It If any blank has positive results, list all the concentrations detected and flagging level (flagiers.  Laboratory Control Standard  3.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?  ACTION: Call laboratory for LCS form submittal. If data are not available, eject (R) data associated with that batch.  2.2 Is a LCS Summary Form present?	4.3 Is the method blank less than the PQL? (See attached table for PQLs).  4.4 Do any method blanks have positive results for VPH parameters? Qualify data according to the following:  For VPH contaminants: If the sample concentration is < 5 × blank value, flag sample result "U" If the sample concentration is > 5 × blank value, no qualification is needed. It If any blank has positive results, list all the concentrations detected and flagging level (flagging level effers.  Laboratory Control Standard  3.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?  ACTION: Call laboratory for LCS form submittal. If data are not available, eject (R) data associated with that batch.	4.3 Is the method blank less than the PQL? (See attached table for PQLs).  4.4 Do any method blanks have positive results for VPH parameters? Qualify data Yes No Attached to the following:  For VPH contaminants:  If the sample concentration is < 5 × blank value, flag sample result "U"  If the sample concentration is > 5 × blank value, no qualification is needed.  If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 10x or 5 × fiers.  Laboratory Control Standard  3.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?  ACTION: Call laboratory for LCS form submittal. If data are not available, eject (R) data associated with that batch.	It If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.  4.3 Is the method blank less than the PQL? (See attached table for PQLs).  4.4 Do any method blanks have positive results for VPH parameters? Qualify data  4.5 Yes No No NA A A Control Standard:  For VPH contaminants:  If the sample concentration is < 5 × blank value, flag sample result "U"  If the sample concentration is > 5 × blank value, no qualification is needed.  It If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 10x or 5 × blank value) fiers.  Aboratory Control Standard  3.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?  ACTION: Call laboratory for LCS form submittal. If data are not available, eject (R) data associated with that batch.  4.2 Is a LCS Summary Form present?  Yes No NA	If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.  4.3 Is the method blank less than the PQL? (See attached table for PQLs).  4.4 Do any method blanks have positive results for VPH parameters? Qualify data  Yes No N/A Comments:  For VPH contaminants:  If the sample concentration is < 5 × blank value, flag sample result "U"  If the sample concentration is > 5 × blank value, no qualification is needed.  If If any blank has positive results, list all the concentrations detected and flagging level (flagging level = 10x or 5 × blank value) on the checklist.  Laboratory Control Standard  3.1 Was a laboratory control standard (LCS) run with each analytical batch of 20 samples or less?  ACTION: Call laboratory for LCS form submittal. If data are not available, eject (R) data associated with that batch.  Yes No N/A Comments:	If no, document discrepancy in case narrative and contact lab for justification. Consult senior chemist for action needed.  4.3 Is the method blank less than the PQL? (See attached table for PQLs).  4.4 Do any method blanks have positive results for VPH parameters? Qualify data Yes No No N/A Comments:  4.5 Do any method blanks have positive results for VPH parameters? Qualify data Yes No No N/A Comments:  4.6 To any method blanks have positive results for VPH parameters? Qualify data Yes No No N/A Comments:  4.7 To any N/A Comments:  4.8 To any No N/A

						-			
	5.3	Is the recovery of any analyte outside of control limits?		Yes []	No 🗹	N/A [_]	Comments:		
	NOTE	: A <u>full</u> target, second source LCS is required by MADEP.		4	0				
	The la	: MADEP guidelines list LCS recovery limits as 70-130 except for no boratory must identify any other analytes that routinely exceed 70-130 po ached table for a listing of MADEP LCS control limits vs. the control limits	ercent. See					111 1	
ACTI detect above	results w	recovery is above the upper limit, qualify all positive sample results with ithin the batch as (J). If LCS recovery is <10%, positive and non-determination of the control	un the batch ct results are	as (J). If rec rejected (R)	covery is be unless the	low the lower e QC limit f	r limit but > 10% or that compou	o, qualify all positive and is below 10%	and no- (flag as
	11				N. ( )	NT/A F 2			
	5.4	Are 80% of LCS recoveries within laboratory control limits?		Yes [V]	No []	N/A	Comments:	1 2 44	
	judgm above	ON: If 80% of LCS recoveries are not within limits, use present and consult Senior Chemist. If more than half of the reconcontrol limits, qualify all positive results as (J). If more than leries are below control limits, batch may require rejection and rear	veries are half of the	*		ig d			
6.0	Matri	x Spikes			1				
ACTIO		Vere project-specific MS/MSDs collected? List project samples that were , contact senior chemist to see if any were specified.	spiked.	Yes 🗾	No [_]	N/A [_]	Comments:		
	6.2	Is the MS/MSD Recovery Form present?				HATCHWATTER TO DE	GW 16		
ACTI	ON: If	no, contact lab for resubmission of missing data.		Yes L	No [_]	N/A []	Comments:		
	6.3	Were matrix spikes analyzed at the required frequency of samples per matrix?	1 per 20	Yes 🔟	No [_]	N/A []	Comments:		
ACTI	ON: If	any matrix spike data are missing, call lab for resubmission.							
		50-E 11. 99		201				<i>n</i> =	
				4	£		and the second second	<del></del>	

का।					
6.4 Are	any VPH spike recoveries outsi	de of the QC limits?	Yes No No N/A	] Comments:	Ψ
NOTE: $%R = (S)$	SSR-SR) x 100% W SA	There: SSR = Spiked sample result SR = Sample result		iii Y	
	S	A = Spike added			
NOTE: A fu	ll target, second source MS/MSI	is required by MADEP.			
NOTE: MAI vs. the contr	DEP guidelines list MS/MSD record limits listed in the QAPP.	overy limits as 70-130 except for naphti	halene. See the attached table	for a listing of MADE	P MS/MSD control limits
NOTES: 1) I	If only one of the recoveries for an If the MS/MSD was performed by the	MS/MSD pair is outside of the control limit e laboratory on a non-project sample, no q	s, no qualification is necessary. Unalification is required.	Jse professional judgme	nt for the MS/MSD flags.
recoveries of the MS a	flags only apply to the sample spi and MSD are lower than the lower of are considered unusable and flagged	ked. If the recoveries of the MS and MS control limit but > 30%, qualify both position (R).	SD exceed the upper control limit ve results and non-detects (J). If the	it, qualify positive resul the MS/MSD recovery i	ts as estimated (J). If the $s < 30\%$ and the sample is
ACTION: Laboratory evaluated, but no flags	control limits apply when spiked sare applied.	sample results fall within the normal calibr	ation range. If dilutions are requi	red due to high sample	concentrations, the data i
6.5 Are	any RPDs for MS/MSD recover	ies outside of the QC limits?	Yes [ ] No [ N/A [	Comments:	
NOTE: RP	$PD = S-D \times 100\%$ (S+D)/2	Where: S = MS sample result D = MSD sample result	Tes No Es TWITE	Comments.	
NOTE: MADEP gui limits listed in the QA	idelines list MS/MSD RPD limits i APP.	for both water and soils as ≤50. See th	e attached table for a listing of	MADEP MS/MSD RP	D limits vs. the control
ACTION: If the RP	D exceeds the control limit, qua	lify positive results and non-detects (J)		4	
ACTION: Laborate concentrations, the da	ory control limits apply when ata are evaluated, but no flags ar	spiked sample results fall within the e applied.	normal calibration range. I	f dilutions are requir	ed due to high sample

Surro	gate Recoveries		is		15	* *		
	VPH surrogate recoved blank? If yes, were		poratory limits for any	sample or	Yes [_	No [⊿	N/A [_]	Comments:
NOTI	E: $%R = Q/D \times 100\%$		= sample surrogate = surrogate added	e result				
	E: MADEP guidelines for both detectors.	list surrogate limits	for both water and so	oils as 70-				
recove recove flagge NOTH	eries below the QC lineries above the QC learn is <10% (unless the das stated above), flag	nit, qualify non-determit, qualify only e QC limits are below positives (J) and reveries fail due to or	dilution, results are no	nd (2) For surrogate results are				
2	ling Accuracy	if the case harrative.			ā			
8.1 Were tr	rip blanks shipped with V	OC samples and analy	yzed?			/		
NOTE: M	ADEP requires trip blai	nks per the following	frequency:		Yes [_	∐ No [_]	N/A []	Comments:
	Soil/Sediment	Aqueous	Drinking Water					
Option 1	Not Required	Not Required	1 per cooler VOAs/VPI	Н				
Option 3	1 per 10 samples	1 per 10 samples	1 per 10 samples					

7.0

8.0

				-		
8.2 Do any trip blanks have positive results?		Yes []	No N/A	Comments:		
ACTION: Prepare a list of samples shipped in the same blank.	e cooler as the contaminated					
ACTION: Evaluate trip blank results against method be contaminant may be laboratory-derived. If result according to the table below.		**				
Sample conc. < 5x blank value: Sa	ample conc. > 5x blank value:					
Flag sample results "JB"	lo qualification is needed				**	
8.3 Were ambient blanks shipped with VPH samples and analy NOTE: MADEP requires ambient (field) blanks per the for Soil/Sediment Aqueous Dri		Yes [_]	No N/A	Comments:	F. 100	2
	Not Required					
Option 3 1 per 10 samples 1 per 10 samples 1	per 10 samples	7	1			
8.4 Do any ambient blanks have positive results?		Yes []	No [] N/A []	Comments:		
ACTION: Prepare a list of samples associated with the cont	taminated blank (all collected fro	om the site	on that day).			
ACTION: Evaluate ambient blank results against method are not lab- and/or shipment-related, qualify according to the		ne if conta	minant may be laborate	ory- and/or shipm	nent-derived. If re	sult
8.5 Were rinsate blanks collected? Prior to evaluating rassociated samples from the senior chemist.	rinsate blanks, obtain a list of the	Yes [_]	No N/A	Comments:		
NOTE: MADEP does not specify the collection of rinsat	te blanks.				id	
	7					
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## OLIN CORPORATION

## LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST VOLATILE PETROLEUM HYDROCARBONS BY METHOD MADEP

		- +¢		- 61	/		7. 02	
	8.6 Do any rinsate blanks have positive results?		Yes [_]	No [_]	N/A	Comments:		
ACTI	ON: Evaluate rinsate results against blank results to determine if conta ambient-, or shipment-related, qualify according to the table above (8.2).		ay be labor	atory-, an	nbient-, or ship	ment-derived.	If results are	not lab-,
9.0	Field Duplicates			<i>)</i> :				
	<b>9.1</b> Were field duplicate samples collected? Obtain a list of samples and their field duplicates.	associated	Yes [	No [_]	ها الرياب	Comments:	W16 DUT	þ
	9.2 Were field duplicates collected per the required frequency?  SOW QAPP  MADEP Option 1(1 per 20)  MADEP Option 3 (	1 nor 10)	Yes Lu	No [	N/A [_] (	Comments:		
				/				
	9.3 Was the RPD $\leq$ 50% for soils or waters? Calculate the RPD for all reattach to this review.	sults and	Yes 📝	No []	N/A [] (	Comments:	Dup	ZRAI
ACTI	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both samp	le results	if the RPD e	exceeds 50	1%. 0-kylen	5 U	5.2	3,9
10.0	Application of Validation Qualifiers			v v	CS-CY CON TOTAL UPH	(j) 810 (dj) 810	770 770 770	5.1 5.1
	Was any of the data qualified?	e   37 m   9   38 m   10	Yes []	No 🗾	/	Comments:		
	If so, apply data qualifiers directly to the DQE copy of laboratory report and for entry in database.	flag pages		For a				
								*
REFE	RENCES			i jar				

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STL-Westfield, 2002. "Olin - General Chemistry Control Limits (Soil & Water)," Severn Trent Laboratories, Inc., 53 Southampton Road, Westfield, MA, 01085.

USEPA, 1988. "Laboratory Data Validation Functional Guidelines for Evaluating Organic and Inorganic Analysis," EPA/540/R-94-012 and EPA/540-R-94-013, July 1988.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance / Quality Control (QA / QC Requirements," BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.

MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance / Quality Control Guidelines for Sampling, Data Evaluation and reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

A CISION 1'5' IJOA YOOY

ACTION: If no, contact lab for submission of copy of completed COC.

## LEVEL I DATA QUALITY EVALUATION STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

Sr. Review/Date Chris Ricard	11/13/07
Lab Report # 360-11839-1	$ \bot$ $\bot$ $\cdot$
Project # 630006 00 11. 61.1	_ ' / -

	ICP METALS BY METHOD 6010B/200.7	6300060011.	<u> </u>
diss	solved iron	2	
1.0	Laboratory Deliverable Requirements		= " x
	1.1 Laboratory Information: Was all of the following provided in the laboratory report? Yes No NA Check items received.	Charles No. 9 1	
	Name of Laboratory  Address  Project ID  Phone #  Sample identification - Field  Client Information:  Name  Address  Client Contact  (IDs must be cross-rei	d and Laboratory	
	Client Information:	ferenced)	4. S.
CTI	ION: If no, contact lab for submission of missing or illegible information.		* * * * * * * * * * * * * * * * * * *
	1.2 Laboratory Report Certification Statement  Yes [ No [ ] N/A [	] Comments:	
Does	the laboratory report include a completed Analytical Report Certification in the required format?		98 ES
CTIC	ON: If no, contact lab for submission of missing certification or certification with correct format.		4
	1.3 Laboratory Case Narrative:  Yes 1 No 1 N/A 1	Comments:	
	Narrative serves as an exception report for the project and method QA/QC performance.  Narrative serves as an exception report for the project and method QA/QC performance.  Narrative inc	ludes an explanation	of each discrepancy
	Certif	ication Statement.	g 11
CTIC	ON: If no, contact lab for submission of missing or illegible information.		e e e e e e e e e e e e e e e e e e e
	1.4 Chain of Custody (COC) copy present with all documentation completed  Yes No No NA	] Comments:	
	NOTE: Olin receives and maintains the original COC.	2	1 2 2

# OLIN CORPORATION LEVEL I DATA QUALITY EVALUATION – OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

	NUA		44	/			196	
1.5 Sample	Receipt Information (Coo.	ler Receipt Form pre	sent?):	Yes No	N/A	Comments:		67.67 S
Were each of into the labor	of the following tasks compleratory?	eted and recorded upon	receipt of the sample(s)	)				6 <sup>3</sup> 3 5
Sample temperature	e confirmed: must be 1° – 10	C. (If samples were ser	nt by courier and delivere	d on the same day as	s collection, tempe	rature requiremen	t does not apply).	
/		. / .					76.	
Container type note	ed sample condition obser	ved 🗹 pH verified (wh	ere applicable) DField:	and lab IDs cross rei	ferenced		182	4.
	<u> </u>			12				
ACTION: If no, cont	act lab for submission of mis	sing or incomplete docu	mentation.		e vi		*	1
							. W	
II III III III III III III III III III		ili Politika radian no man						
1.5.1	Were all samples delivered	to the laboratory withou	it breakage?	Yes 🗸 No		Comments:	H <sub>a</sub>	
			* **					
	*		- F					
1.5.2	Does the Cooler Receipt	Form or Lab Narrative	indicate other problems	*				
1.512	with sample receipt, condit circumstances affecting the	ion of the samples, analy	tical problems or special	Yes [ No [	N/A []	Comments:		
W SILVE		1		,	u's		- R	
					7	190		
	Results Section: Was eac y report for each sample?	h of the following requi	rements supplied in the	Yes No [	N/A []	Comments:		
7						1.00		_
1,	1	_/		1	MA			
Field ID and Lab		collected La A	nalyst Initials	Date of prepare	r LI %	moisture or solid		porting limits
Clean-up method	Analysis metho		Preparation method	uits (soils must be re			nu analysis, when	e applicable
□ Matrix	☑ Target analytes an	d concentrations	. Lea UI	nts (sons must be re	horren in m'a weigh	шу		34 E
							9	
ACTION: If no, cont	act lab for submission of mis	sing or incomplete infor	nation.			ál.		
			(2).		*			
17 04/00	Information: Was each	of the following inform	mation supplied in the	Yes I No	1 N/A [ ]	Comments:	1	**
	ort for each sample batch?	ine ionowing imori	imiton supplied in the	162 1/0	NA	Comments.		

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### **OLIN CORPORATION** LEVEL I DATA QUALITY EVALUATION - OPTION 1 STANDARD OPERATING PROCEDURE AND CHECKLIST ICP METALS BY METHOD 6010B/200.7

1		/		1/4		-	
E Me	ethod bla	nk results LCS reco	veries MS/MSD recoveries and	RPDs Laboratory	duplicate results (wher	e applicable)	
ACTI	ON: If r	no, contact lab for submiss	sion of missing or incomplete information	ation.			
					35		
2.0	Holdi	ng Times					
Have	exceed		ermined from date of collection to etals is 180 days from sample collect			N/A _]	Comments:
NOTE	: List sa	mples that exceed hold tin	ne with # of days exceeded on checkl	ist			* *
ACTI		사람이 살아보다 아이들의 지원에게 하면 아이들은 얼마를 하는데 살아내는 것이 없었다.	re exceeded, qualify all positive resu olding time) reject (R) all non-detect				
3.0	Labo	ratory Method					
	3.1	Was the correct labo	ratory method used?		Yes No No	N/A [_]	Comments:
*	÷	Water Digestion Soil Digestion Metals	3005A or 3010A or 3020A 3050B 6010B or 200.7				
com	pared to		atory to provide justification for a contact senior chemist to information				
	3.2	Are the practical qu	antitation limits the same as the	se specified by the	Yes No No	N/A [_]	Comments:
ron	E: Verify	that the reported metals	match the target list specified on the	coc.		5 9 29	950
6010		*					
				2 610			

	: If no, evaluate variation with respect to sample matrix, preparation, dilution, etc. If sample PQL is indeterminate, contact lab for explanation.					
3.3	Are results present for each sample in the SDG?	Yes 🔝	No [_]	N/A [_]	Comments:	120
ACTION: If	no, check Request for Analysis to verify if method was ordered and COC to verify that i	it was sent, as	nd contact I	ab for resubm	ission of the mis	sing dat
3.4	If dilutions were required, were dilution factors reported?	Yes 🗾	No [_]	N/A [_]	Comments:	
ACTION: If	no, contact the lab for submission.		× ,			
.0 Met	hod Blanks					
.u Intell	nod Dianks					
4.1	Is the Method Blank Summary present?	Yes 🚺	No [ · ]	N/A [_]	Comments:	
ACTION:	If no, call the laboratory for submission of missing data.					
4.2	Frequency of Analysis: Was a method blank analyzed for each digestion batch of < 20 field samples?	Yes 🔟	No [_]	N/A [_]	Comments:	
Annual Control of the	If no, contact laboratory for justification. Consult senior chemist for action trate non-compliance.					
4.3	Is the method blank less than the PQLs for all target elements?	Yes I	No [ ]	N/A [ ]	Comments:	
NOTE: MA samples	DEP requires the method blank to be matrix matched and digested with the			,		
4.4 the fol	Do any method blanks have positive results for metals? Qualify data according to llowing:	Yes [_]	No 🗾	N/A [_]	Comments:	11 411

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is > 5 × blank value, no qualification is needed.

lagging level (flagging level

0 Lab	oratory Control Standard		#'		
U <u>Liau</u>			,		
5.1	Was a laboratory control standard run with each analytical batch of 20 samples or less?	Yes 🗹	No [_]	N/A [_]	Comments:
NOTE: A	full target, second source LCS is required by MADEP.	5	* 1		
ACTION:	Call laboratory for LCS form submittal. If data are not available, use				
profession	I indoement to evaluate data accuracy associated with that batch.		/		8
5.2	Is a LCS Summary Form present?	Yes 🗹	No [_]	N/A [_]	Comments:
ACTION:	If no, contact lab for resubmission of missing data.	3 2		/	
5.3	WADEP	Yes [_]	No 🗸	N/A [_]	Comments:
	ole Type	#3			
Wat	within Lab generated limits			8	
Soil	If recovery is above the upper limit, qualify all positive sample results				
within the	batch as (J). If recovery is below the lower limit, qualify all positive and	6.0			3
non-detect	results within the batch as (J). If LCS recovery is <30%, positive and non-				
	ts are rejected (R).		č.		
-					

#### 6.0 Matrix Spikes

Matrix spikes may be collected at different frequencies based on monthly, quarterly, or task specific schedules. Confirm spike requirements for each set with the senior chemist.

6.1 Were project-specific MS/MSDs collected? List project samples that were spiked.

ACTION: If no, contact senior chemist to see if any were specified.

6.2 Is the Matrix Spike/Matrix Spike Duplicate Recovery Form present?

NOTE: A <u>full</u> target, second source MS/MSD is required by MADEP.

ACTION: If any matrix spike data are missing, call lab for resubmission.

6.3 Were matrix spikes analyzed as indicated on the COC and project schedule?

ACTION: If any matrix spike data are missing, call lab for resubmission. If none, no qualification is needed. Narrate non-compliance.

6.4 Are any metal spike recoveries outside of the QC limits?

	MADEP	QAPP	
Sample Type	% Rec	% Rec	Method
Water	75-125	N/A	6010B
Water	N/A	70-130	200.7
Soil	75-125	75-125	6010B

NOTE:  $%R = (SSR-SR) \times 100\%$ 

Where: SSR = Spiked sample result SR = Sample result

SA = Spike added

NOTE: If dilutions are required due to high sample concentrations (> 4X spike), the data are evaluated, but no flags are applied.

Yes [ ] No [ N/A [ ]

Yes No N/A Comments:

Yes [ No [] N/A [] Comments: Sample
GW16 was submitted for us/MSD analysis.

Comments:

NOTE: If only one of the recoveries for an MS/MSD pair is outside of the control limits, no qualification is necessary. Use professional judgment for the MS/MSD flags. ACTION: MS/MSD flags only apply to the sample spiked. If the recoveries of the MS and MSD exceed the upper control limit, qualify positive results as estimated (J). If the recoveries of the MS and MSD are lower than the lower control limit, qualify positive results and non-detects (J). 6.5 Are any RPDs for MS/MSD recoveries outside of the QC limits? NOTE:  $RPD = S-D \times 100\%$ Where: S = MS sample result (S+D)/2D = MSD sample result NOTE: If dilutions are required due to high sample concentrations, the data are evaluated, but no flags are applied. ACTION: If the RPD exceeds the control limit, qualify positive results and non-detects (J). Laboratory Duplicate 7.0 7.1 Was a laboratory duplicate sample analyzed? If so, is the Laboratory Yes [ ] Duplicate Sample Form present? NOTE: MADEP refers to this sample as a "matrix duplicate". ACTION: If not analyzed, qualification is not needed. If data is missing, contact laboratory for resubmission of report. Narrate non-compliance. 7.2 Is the RPD between the result for the laboratory duplicate sample and the result for the parent sample outside of the QA/QC limits?

MADEP Laboratory Duplicate Sample RPD Criteria:	QAPP RPD
For aqueous results > $5 \times RL$ , RPD must be $\pm 20\%$	20
For aqueous results $< 5 \times RL$ , RPD must be $\leq RL$	20
For soil/sediment results > $5 \times RL$ , RPD must be $\pm 35\%$	20
For soil/sediment results $< 5 \times RL$ , RPD must be $\le 2 \times RL$	20

ACTION: If the RPD exceeds the limits, qualify both positive results and non-detects as estimated and flag them J. Narrate non-compliance

#### 8.0 Sampling Accuracy

The majority of ground water samples are collected directly from a tap, process stream, or with dedicated tubing. Rinse blanks will not be collected.

- 8.1 Were rinsate blanks collected? Prior to evaluating rinsate blanks, obtain a list of the associated samples from the senior chemist.
- 8.2 Do any rinsate blanks have positive results?

NOTE: MADEP does not require the collection of rinsate blanks.

ACTION: Evaluate rinsate results against blank results to determine if contaminant may be laboratory-derived. If results are not lab-related, qualify according to below.

If the sample concentration is  $< 5 \times$  blank value, flag sample result non-detect "U" at the PQL or the concentration reported if greater than the PQL.

If the sample concentration is  $> 5 \times$  blank value, no qualification is needed.

#### 9.0 Field Duplicates

9.1 Were field duplicate samples collected? Obtain a list of samples and their associated field duplicates.



GW16 and GW16 DUP

				and the second second second			
	9.2 Were field duplicates collected per the required frequency?	Yes 🗾	No [	N/A 🏖	ulilo7 Comments:		
so	W □ QAPP (1 per 10) 1 MADEP Option 1 (1 per 20) □ MADEP Option 3 (1 per	10) 🛘	,	@/	11/12/07	10	
	9.3 Was the RPD ≤ 50% for soils or waters? Calculate the RPD for all result attach to this review.	s and Yes	No [_]	N/A [A	Comments:		2.1
	attach to this review.		F 4	dissolved	iron	1.2 %	RPD
ACTIO	ON: RPD must be ≤50% for soil and water. Qualify data (J) for both sample re	esults if the RPI	exceeds 50	)%.			
10.0	Special QA/QC			,			# W
	10.1 Were both total and dissolved metals analysis performed? If so dissolved metal concentration should not exceed that of the total metal.	, the Yes [_]	No 🔼	N/A [_]	Comments:		
							45

ACTION: If results for both total and dissolved are  $\geq 5x$  the PQL and the dissolved concentration is 10% higher than the total, flag both results as estimated (J). If total and dissolved concentrations are less than 5x the PQL and the difference exceeds 2x the PQL, flag both results as estimated (J)

10.0	Application of Validation Qualifiers	¥ ,	341	/	290
*	Was any of the data qualified?	<u>n</u>	Yes [_]	No N/A	Comments:

If so, apply data qualifiers directly to the DQE copy of laboratory report and flag pages for entry in database.

#### REFERENCES

- LAW, 1999, "Final Quality Assurance Project Plan, Olin Wilmington Property, 51 Eames Street, Wilmington, MA", LAW Engineering and Environmental Services, Kennesaw, GA 30144. August 1999
- U.S. Environmental Protection Agency (USEPA), 1989. "Region 1 Laboratory Data Validation Functional Guidelines For Evaluating Inorganic Analyses"; Hazardous Site Evaluation Division; February 1989.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Massachusetts Quality Assurance and Quality Control (QA/QC) Requirements." BWSC-CAM, Interim Final Draft, Revision No. 2, 5 October 2001.
- MADEP, 2001. Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup, "Quality Assurance and Quality Control Guidelines for Sampling, Data Evaluation and Reporting Activities," BWSC-CAM, Section VII, Public Comment Draft, Revision No. 0, 21 December 2001.

#### **APPENDIX C**

Weir Monthly Inspection Reports - BSC Group, Inc.

#### **APPENDIX C**

Weir Monthly Inspection Reports - BSC Group, Inc.



FILE 6300060011/6300060011
TRANSMITTAL

To: Ms. V	Vinifred	McGowan		Date:	February 2, 2007	
Wiln	Wilmington Conservation Commission			Ргој. No:	89241.00	
121	121 Glenn Road			Project:	DEP File #334-419	
Wiln	ington,	MA 01887		_		
We are sen	ding you	11.				
Attached			Jnder Separate Cover			
.—		<del></del> .				
Via: ☐ Overnigh ☐ Messeng			Faxi Direct from printer	⊠ Regular Mail □ Other:		33 Waldo Street Worcester, MA 0160
The following items:  Change Order  Copy of Letter  Digital Media			Orawings Photocopies Plans	☐ Prints ☐ Samples ☐ Specifications ☐ Other:		Tel: 508-792-4500 Fax: 508-792-4509
No. of Cop	ies Dr	awings No.	Date or Revision	Description		1
1			February 1, 2007	January Weir	Reports and Letter	
This inform  For Your  Uncheck  Prelimin  Revised  Final Pla	Informa ed ary Plans	tion	Approved as submitted Approved as noted Disapproved Returned for corrections Sent for your review & co	☐ Resubm ☐ Return ☑ Submit	corrected prints	
Remarks:	Dear M	s. McGowan,				
	Attach	ed is the weir	inspection reports for	the Olin facility	for December.	
	Please	call me at 61	7-896-4355 with any a	dditional questic	ons.	
	Thank	you.				
cc:	Mr. Joe Mr. Br Mr. Jir	eve Morrow, e Coyne, DEF ain Guichard n DiLorenzo, ter Thompso	From: , Olin EPA	I Ino L Timothy Witm	Little an	Note: If enclosures an not as noted, please contact us immediately



15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 Fax: 617-896-4301

February 1, 2007

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

Re:

Olin Corporation - DEP File #344-419

Weir Inspection Reports BSC Job #89241.00

Dear Commission,

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of January 2007. BSC conducted the inspection on Wednesday, January 31, 2007.

The resource areas appear to be in good condition. There has been no disturbance to the resource areas and no soil disturbing activities are occurring on site. Vegetation within the surrounding wetland areas and the various channels on site appear healthy.

West Ditch Off-Property

Station A was mostly frozen. Visible in some small areas of open water was a beige and rust colored precipitate that has settled onto the channel bottom. The water at Station A and around the vicinity of Station A was clear. Station B was completely frozen over. The water and channel bottom was not visible during this inspection.

#### Weir

Station D, located up stream of the Weir was completely frozen. Downstream of the Weir the water was mostly frozen with only small section of open water present during the time of the inspection. The outlet pipe from the Weir had a moderate flow of clear water discharging from it. The on property West Ditch had a low volume of clear water flowing over the check dam. The rocks below the outlet pipe from the Weir and the West Ditch discharge point were covered within rust colored material. Visible through the small open sections in the ice was a light brown and beige colored precipitate along the channel bottom. The colorations along the channel bottom extended down stream and were visible in various section of the South Ditch.

Engineers

Wetland Areas South of the South Ditch

Stations H and I were both frozen over. The vegetation in both areas appeared healthy.

Environmental Scientists

**GIS Consultants** 

South Ditch Downstream of the Weir

Landscape

The water at Station E was slightly cloudy with a beige and greenish colored precipitate visible throughout the water column. This coloration extended along the majority of the channel near Station E. Along the bottom of the channel some areas had dense concentrations of the beige colored precipitate that has settled onto the channel bottom. Station F, Station G and the Haybale line on the eastern side of the site were all frozen over.

Planners

Architects

Surveyors

The check dam between Station E and Station F and the check dam just downstream from Station F should be repaired or removed. Some erosion is occurring along the banks of the channel where the check dams are located. At this time it is not clear whether the check dams should be



removed or replaced. Additional historical site information regarding the check dams will be gathered before a determination is made to repair/replace or remove the check dams.

#### Wildlife

During the December 28, 2006 inspection coyote tracks and scat were observed near Stations E, H, and I.

If you have any questions or need additional information please contact me at 617-896-4355.

Sincerely,

BSC Group, Inc.

Timothy R. Witman

Environmental Inspector

#### Enclosures:

Cc:

Mr. Steve Morrow, Olin Corp.

Mr. Joe Coyne, DEP

Mr. Brian Guichard, Olin Corp. Mr. Peter Thompson, MACTEC

Mr. Jim DiLorenzo, EPA

Wilmington Site

Date 1/31/07	Time	7:30am	Inspectors Tim Witman BSC Gray
Conditions: overcest cold ten	10 218° F	f	
Station	and the second	pitate vation	Other Observations
	Yes	No	
Offsite Fenced Ditch System			mostly frazen
Station A	V	,	Beige and rust colors on bottom, clear water
Station B			Frozen over staff gauge . 9
West Ditch Foot Bridge		,	
Station C		V	Filhed in
Weir - Upstream		,	
Station D			Frozen over
Weir - Downstream	,		water is slighty chindy bettern has colors
Station E		,	Greenish / Beige coloration in the water Column
Station F		1	Frozen over
Station G			Frozen over
Unnamed Ditch			
Station H		/	Frozen over
Station I		<b>V</b>	Frozen over
Supplemental Inspection			
Locations (designate station			
location on page 2 of 2)			
Staff Gauge Level			
Condition of Weir / Haybale Ba	ırriers	Mostly Fr	vzen, moderate amount of clear
C H	· I Pipe	/ / /	nount of clear water it flowing
from the on property west or	lites. Ku.	st coloned	precipitate on recles at the outlet
bettem of channel has light	brown co	lor Beige	e coloured precipitate at first check of
			*
Hay Sale line = frozen over	-	100	
		1011	
Observed, egypte sent new E	H	2 1	1/17/2007
Together State The It	117-15	Lpiners	

Wilmington Site

#### Interim Action Plan West Ditch Precipitate Inspection Report

Date	1-26-07	Time	Inchestore	Fact	Ci
Duto_	1 50 0 ,	7000	inspectors -	/ rank	Gay

	Station		pitate vation	Other Observations
		Yes	No	
Offsite Fer	ced Ditch System		0	
	Station A	V		Frozen over
750	Station B			Frozen over
West Ditch	Foot Bridge			
	Station C		V	Filled in
Weir - Ups	tream			
	Station D		V	Frozen over
Weir - Dow	nstream			
	Station E	V		clear water. Bottom is brown
8	Station F	V		Frozen over
	Station G			Frozen over
Unnamed I	Ditch			
	Station H		V	Frozen over
	Station I		V	Frozen over
Locations	ntal Inspection (designate station n page 2 of 2)			
Staff Gaug	e Level	.91		
_	1 1	0	1	from outlet per Medium flo
easurere bale line:	green mist is s	hosting Noting	exp from	1 0 101
	in#2 (Aprox 36	yards v	11 O 12 11 CONCE 124 CONCE 13	

#### Inspection Report

#### Interim Action Plan West Ditch Precipitate

## Wilmington Facility Olin Chemical Corporation

Date: 1-5-07 Time: 1215 Inspectors: Frank Gay

Station	Precipitate Observation		Other Observations			
	yes	No				
Offsite Fenced Ditch System: Station A Station B	<u>/</u>	V	Clear water Bottom is leaves.  Clear water Bottom is leaves. Staff gauge reads 0.9'			
West Ditch Foot Bridge: Station C		V	Filled in			
Weir – Upstream: Station D		V	18"clear water. Bottom is rocks.			
Weir – Downstream: Station E Station F Station G	V -	_ 	clear water. Bottom is light brown. clearwater. Bottom is rusty red color. 3"water. Bottom is mud.			
Unnamed Ditch: Station H Station I	_	<u>V</u>	12" clear water. Bottom is grass and leave 4" clear water, Bottomis leaves and mud.			
Supplemental Inspection Locations (designate station location on page 2of 2)						
Staff Gauge Level:		•				
Condition of Weir! Haybale Ba water is pretty clear f where a bluish grey of from light brown, togs Haybake Line: water	rriers: C hranghe claud ey, to l How.	learness black	rough center of haylog le . Bottom is middly.			
Note: Nater isgaing of Ark 30 yards upstream of Ark dam #3 Caprex 44ds	courst	1 the Nater ream	side of instead of over chief dam #2 (ap.			
Observed: 2 B	lue J	ays	> adozen Finches, and > adozen			
			Area G.			

#### Inspection Report

#### Interim Action Plan West Ditch Precipitate

## Wilmington Facility Olin Chemical Corporation

Date: F/19-07	Time: 1000	Inspectors: _	Frank	Gay	
				1	

Station	Preci Obser		Other Observations
	yes	No	
Offsite Fenced Ditch System: Station A Station B	<u></u>	<u>_</u>	
West Ditch Foot Bridge: Station C		V	Filled in
Weir – Upstream: Station D			iced over
Weir – Downstream: Station E Station F Station G	\ <u>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</u>		clear water. Bottom is light brown. clear water. Bottom is rusty red. 90% Frozen. 71/2"water. Bottom is muc
Unnamed Ditch: Station H Station I		<u> </u>	Frozen over Frozen over
Supplemental Inspection Locations (designate station location on page 2of 2)			
Staff Gauge Level:			
Condition of Weir/Haybale Bar Bubbling events observe bubbling events observe bale Line: Water flow Note: Water is (Aprox. 30 yds upstream	middle middle d. Bot ing Hara going of Ar	ear wo tom vo ough ce aroun	ter from outlet pipe. Medium flow. 50% Frozente green Fog is being emitted. More than 10 writes in color. Light brown, grey, green, and black inter of haybak. Bottomis muddy. I that side of instead of over check dam #2. Water is going ground the side of instead of some stream of Area F).

#### Inspection Report

#### Interim Action Plan West Ditch Precipitate

## Wilmington Facility Olin Chemical Corporation

Fr; Date: <u>1-12-07</u>	1230		Frank Hay	
Date: 1-12-01	Time: 1200	inspectors: _	Trial e ay	

Station	Precipitate Observation		Other Observations
	yes	No	
Offsite Fenced Ditch System: Station A Station B	<u>_/</u>	<u>_</u>	4/15"clear water. Bottom is leaves clear water. Bottom is leaves. Staff gauge reads 0.9"
West Ditch Foot Bridge: Station C	15 <b></b>	_V	Filled in
Weir – Upstream: Station D	ĵ		17"2" clearwater. Bottom is rocks and leaves
Weir – Downstream: Station E Station F Station G	V  -	<u>_</u>	clear water. Bottom is light brown. clearwater. Bottom is rusty red. 2"water. Bottom is mud.
Unnamed Ditch: Station H Station I		<u>v</u>	3"clearwater. Bottom is grass and leaves Frozen over
Supplemental Inspection Locations (designate station location on page 2of 2)			

Staff Gauge Level:

Condition of Weir/Haybale Barriers: Clearwater from antlet pipe Medium flow. Water is pred clear throughout. 2 Bubbling events. Bottom is reddish, light brown, grey, and black in different areas. Haybale line: waterflowing through centered haybale. Bottom is muddy. Note: water is gaing around the side of Instead of over checkdam #2. Nater is going to the side of check dam #3.

Observed: I Red-Tailed Hank, a few finches, and about a dozen Black-Capped chicadees all at or around Area G.



## TRANSMITTAL

To: Ms.	Winifred McG	ouran.		Date:	March 2, 2007		
	Wilmington Conservation Commission			Proj. No:	89241.00		
	121 Glenn Road			-7	DEP File #334-419		
	- CANONIA COMPANIA DA CANONIA COMPANIA	1007		_ Project:	DEF FIIE #334-419		
VIII	nington, MA 0	1887		<u> </u>			
We are ser	iding you:						
Attached	l	$\boxtimes$	Jnder Separate Cover				
Via: ☐ Overnig ☐ Messeng		3/10 mm (a)	Γαχί Direct from printer	⊠ Regular Mail ☐ Other:		33 Waldo Worceste	Street er, MA 0160
The follow Change Copy of Digital M	Order Letter		Orawings Photocopies Plans	☐ Prints ☑ Reports ☐ Other:	☐ Samples ☐ Specifications		98-792-4500 98-792-4509
No. of Cop	oies Drawing	s No.	Date or Revision	Description			
1			March 2, 2007	February Weir Reports and Letter			
			( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )				
This inforr For You Uncheck Prelimin Revised Final Pla	r Information ked ary Plans		Approved as submitted Approved as noted Disapproved Returned for corrections Sent for your review & co	☐ Resubm ☐ Return ☑ Submit	it copies for approval corrected prints copies for distribution		
Remarks:	Dear Ms. McC	owan,					
	Attached is t	ne weir	inspection reports for	the Olin facility	for February		
	Please call m	e at 61	7-896-4355 with any a	dditional questic	ons.		
	Thank you.						
cc:	Mr. Steve Mo Mr. Joe Coyr Mr. Brain Gu Mr. Jim DiLo Mr. Peter Th	ne, DEI nichard orenzo,	, Olin EPA	Jino H Timothy Witma	Teletro	not as not	enclosures are ed, please s immediately



March 2, 2007

15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 800-288-8123

Fax: 617-896-4301

www.bscgroup.com

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

Re:

Olin Corporation - DEP File #344-419

Weir Inspection Reports BSC Job #89241.00

Dear Commission,

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of February 2007. BSC conducted the inspection on Wednesday, February 28, 2007.

The resource areas appear to be in good condition. There has been no disturbance to the resource areas and no soil disturbing activities are occurring on site. Winter conditions persist on the site and the majority of the inspection locations were frozen and snow covered.

West Ditch Off-Property

Station A and B were both frozen and snow covered. It was not possible to determine if a precipitate was present in the water or on the channel bottom.

#### Weir

Station D, located up stream of the Weir was completely frozen and snow covered. There was a low volume of clear water flowing from the outlet pipe. The water below the Weir was cloudy with a white and green colored precipitate visible throughout the water column. The cloudy coloration extended approximately 15-feet downstream of the Weir. The channel bottom was covered with a beige colored precipitate that has settled out of the water. The beige coloration extended up to the first check dam and was visible in small quantities further downstream. There was a very low volume of clear water flowing from the on property west ditch. The majority of the channel downstream of the Weir was frozen and snow covered.

Wetland Areas South of the South Ditch

Stations H and I were both frozen and snow covered.

South Ditch Downstream of the Weir

The South Ditch had frozen and snow covered conditions throughout the majority of the channel. Station E, was mostly frozen. However, a beige colored precipitate on the bottom of the channel was visible through the small breaks in the ice. Due to snow and ice it was not possible to observe the water at Stations F, G and near the haybale line.

Engineers

Environmental Scientists

GIS Consultants

Landscape

Architects

Planners

Surveyors



#### Wildlife

A variety of birds and small mammal tracks were observed throughout the site during the month of February.

If you have any questions or need additional information please contact me at 617-896-4355.

Sincerely,

BSC Group, Inc.

Timothy R. Witman

Environmental Inspector

#### Enclosures:

CC:

Mr. Steve Morrow, Olin Corp.

Mr. Joe Coyne, DEP (Electronically)

Mr. Brian Guichard, Olin Corp.

Mr. Peter Thompson, MACTEC

Mr. Jim DiLorenzo, EPA

## Olin Corporation Wilmington Site

Date	2/28/07	Time	8:00Ang	Inspectors Tim Witnes BSC		
C - O tuns ou	ereust, temp 30 F 11st	+ brance				
		Preci	pitate			
	Station		vation	Other Observations		
		Yes	· No			
Offsite Fend	ed Ditch System					
	Station A		X	Frozen over snow covered		
	Station B		×	Frozen over snow covered		
West Ditch	Foot Bridge					
	Station C		X	Filled In		
Weir - Upstr	ream					
	Station D		X	Frozen Over snow covered		
Weir - Dowr	nstream					
	Station E	X		mostly foren snow and visible though holes heyed		
<b>8</b> 3	Station F	iine	X	Frozen Over snew covered of		
	Station G		X	Frozen over snow covered		
Unnamed D	itch					
	Station H		X	Frozen over snew court		
	Station I		X	Frozenour snow concred		
Supplemen	tal Inspection					
	(designate station					
location on	page 2 of 2)					
Staff Gauge	Level					
Condition of	of Weir / Haybale Ba	arriers	Low Volum	e of clear Water is Flowing from		
the outlet	pine. Water below	the were	necholy .	again 15' demonstrain.		
water is greenish and being releved. Bethin is revered in a love releved precipitate						
very lew flow of cloor wester from the an property west dite b. Reice color on better						
is mostly remembered up to the first wheek dans						
_ South d	talin the Haybole	+ rec. 1	s ice of mot	u- covered.		
	/			=		

### Wilmington Site

Date	2/23/2007	Time _	11:30 Inspectors	Frank Gay	

Offsite Fenced Ditch System  Station A Station B Station B Station C Station D Station D Station D Station E Station G Station G Station F Station G Station F Station G Station G Station G Station F Station G Station G Station G Station G Station G Station G Station I Station G Station G Station G Station G Station G Station F Station G Station G Station G Station G Station G Station G Station F Frozen Over Frozen Over Frozen Over  Froz	Station	SALES SERVICE STREET, N. 1997 S.	pitate vation	Other Observations
Station A				And the second s
Station B	Offsite Fenced Ditch Systen	n la		
Station C	Station A		х	Frozen Over
Station C	Station B		х	Frozen Over
Station D   X   Frozen Over	West Ditch Foot Bridge			
Station D x Frozen Over  Weir - Downstream  Station E Clear water, bottom light gray and to station G x Frozen Over  Unnamed Ditch  Station H x Frozen Over  Station I x Frozen Over  Supplemental Inspection Locations (designate station location on page 2 of 2)  Staff Gauge Level Under snow cover  Condition of Weir / Haybale Barriers: Clear water from outlet with a rust col bottom. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Station C		x	Filled in
Station E Station G Station H Station I Supplemental Inspection Locations (designate station location on page 2 of 2)  Staff Gauge Level Condition of Weir / Haybale Barriers: Sightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over.  Clear water, bottom light gray and the first check da The water is clear with a gray colored bottom.  Clear water, bottom light gray and the frozen over  Frozen Over Frozen Over Frozen Over  Clear water from outlet with a rust colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Weir - Upstream			
Station E Station F Station G Station G Station H Station I Supplemental Inspection Locations (designate station location on page 2 of 2) Staff Gauge Level Condition of Weir / Haybale Barriers: Sightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over.  Clear water, bottom light gray and the Frozen Over Frozen Over Frozen Over Frozen Over Frozen Over Coder water over Clear water from outlet with a rust color bottom. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Station D		х	Frozen Over
Station F Station G Station H Station I Supplemental Inspection Locations (designate station location on page 2 of 2)  Staff Gauge Level Condition of Weir / Haybale Barriers:  bottom. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Weir - Downstream			
Station F Station G Station G Station G Station G Station H Station H Station I Supplemental Inspection Locations (designate station location on page 2 of 2) Staff Gauge Level Condition of Weir / Haybale Barriers: Description Description Condition of Weir / Haybale Barriers: Description Description Clear water from outlet with a rust collaboration of Weir water area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Station E			Clear water, bottom light gray and tan
Unnamed Ditch  Station H Station I Supplemental Inspection Locations (designate station location on page 2 of 2)  Staff Gauge Level Under snow cover  Condition of Weir / Haybale Barriers: Clear water from outlet with a rust col bottom. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Station F		х	
Station H Station I Station I Supplemental Inspection Locations (designate station location on page 2 of 2)  Staff Gauge Level Under snow cover  Condition of Weir / Haybale Barriers: Clear water from outlet with a rust col bottom. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Station G		х	Frozen Over
Station I x Frozen Over  Supplemental Inspection Locations (designate station location on page 2 of 2)  Staff Gauge Level Under snow cover  Condition of Weir / Haybale Barriers: Clear water from outlet with a rust col bottom. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Unnamed Ditch		等 在人员	
Supplemental Inspection Locations (designate station location on page 2 of 2)  Staff Gauge Level  Condition of Weir / Haybale Barriers:  Clear water from outlet with a rust collection. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Station H		x	Frozen Over
Locations (designate station location on page 2 of 2)  Staff Gauge Level  Condition of Weir / Haybale Barriers:  Clear water from outlet with a rust collaboration. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Station I		х	Frozen Over
Condition of Weir / Haybale Barriers:  Clear water from outlet with a rust collaboration. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Locations (designate statio	on		
bottom. Main area is mostly open with clear water except for the center area which is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Staff Gauge Level		Under s	now cover
is lightly cloudy. Most of the open area has a gray colored bottom. Two bubbling events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom.  Haybale area frozen over.	Condition of Weir / Haybale	Barriers:	(	Clear water from outlet with a rust colored
events noticed. Stream is frozen over except for the area around the first check da The water is clear with a gray colored bottom. Haybale area frozen over.	bottom. Main area is mostly	open wit	h clear v	vater except for the center area which
The water is clear with a gray colored bottom.  Haybale area frozen over.	is lightly cloudy. Most of the	open are	ea has a	gray colored bottom. Two bubbling
Haybale area frozen over.	AND THE RESERVE TO THE RESERVE			
	The water is clear with a gra	ay colored	bottom	l.
Negleck and the least of the second and the second	Haybale area frozen over.			
Noticed rabbit tracks in the snow and various birds throughout the tour.	Noticed rabbit tracks in the	snow and	various	s birds throughout the tour.

## Wilmington Site

Date	2/16/2007	Time	1:00	Inspectors	Frank Gay	

Station	KENNEYSPERSENTATION	pitate vation	Other Observations
	Yes	No	
Offsite Fenced Ditch System			
Station A		x	Frozen Over
Station B		xx	Frozen Over
West Ditch Foot Bridge		2 50 52	-4
Station C		x	Filled in
Weir - Upstream			Comp. Wyconydles
Station D		х	Frozen Over
Weir - Downstream			
Station E	x		Clear water, bottom light gray and tan
Station F		x	Frozen Over
Station G		x	Frozen Over
Unnamed Ditch	Article 40		
Station H		x	Frozen Over
Station I		x	Frozen Over
Supplemental Inspection Locations (designate station location on page 2 of 2)			
Staff Gauge Level	Under	Snow C	over
Condition of Weir / Haybale Ba	rriers:	(	Clear water from outlet with a rust colored
bottom. Most of main area froz	zen ove	r except	for an area about three feet wide and
ten feet long. Water is clear ar	d the b	ottom is	rust colored also. Only two bubbling
events were noticed. All of the	strean	n is froze	en over except for the area just before and
just after the first check dam.	The wa	ter is cle	ear with a gray colored bottom.
Haybale area is all frozen over			
	l in the	snow bu	ut there was a large number of birds
seen throughout the tour.			

### Wilmington Site

Date	2/9/2007	Time	8:30	Inspectors	Brian Guichard	
					Frank Gay	

Station	Precipitate Observation		Other Observations			
Station	Yes	No	Other Observations			
Offsite Fenced Ditch System						
Station A		x	Frozen Over			
Station B		×	Frozen Over			
West Ditch Foot Bridge						
Station C		х	Filled in			
Weir - Upstream						
Station D		х	Frozen Over			
Weir - Downstream						
Station E	х		Clear water, bottom grayish cloudy			
Station F		x	Frozen Over			
Station G		х	Frozen Over			
Unnamed Ditch						
Station H		x	Frozen Over			
Station I		x	Frozen Over			
Supplemental Inspection Locations (designate station location on page 2 of 2)						
Staff Gauge Level	0.9′	*				
Condition of Weir / Hay bale B	arriers:		Clear water from outlet with a rust colored			
bottom. Main area mostly froz	en over	with a	few bubbling events noticed under			
the ice. Stream mostly frozen	over ex	cept for	r a thin strip just beyond the first check			
dam up to just past the second check dam with the top water clear and the bottom						
grayish and cloudy. The remainder of the stream including the third check dam is						
frozen over.						
Hay Bail area frozen over.						
Noticed several species of bir	ds and	many ir	nstances of animal tracks in the snow			
along the inspection route.						

500 A1210P



## TRANSMITTAL

To: Ms.	Winifred McGo	wan		Date:	March 30, 2007		
Wiln	Wilmington Conservation Commission			Proj. No:	89241.00		
121	Glenn Road			Project:	DEP File #334-419		
Wiln	nington, MA 01	887		_			
We are sen	ding you:						
Attached			Inder Separate Cover				
Via: ☐ Overnigl ☐ Messeng	7.50		Faxi Direct from printer	Regular Mail		33 Waldo Street Worcester, MA 01608 Tel: 508-792-4500	
The follow  Change  Copy of  Digital M	Order Letter		Orawings Photocopies Plans	☐ Prints ☐ Reports ☐ Other:	Samples Specifications	Fax: 508-792-4509	
No. of Cop	ies Drawings	No.	Date or Revision	Description	Description		
1			March 30, 2007	March Weir R	eports and Letter		
777							
This inforr  For You  Uncheck  Prelimin  Revised  Final Pla	r Information ked ary Plans		Approved as submitted Approved as noted Disapproved Returned for corrections Sent for your review & co	☐ Resubn ☐ Return ☑ Submit	corrected prints		
Remarks:	Dear Ms. McG	Gowar					
	Attached is th	ne wei	inspection reports for	the Olin facility	for March		
	Please call me	at 61	7-896-4355 with any a	dditional questi	ons.		
	Thank you.						
cc:	Mr. Steve Mo Mr. Joe Coyn Mr. Brain Gu Mr. Jim DiLo Mr. Peter The	e, DEl ichard renzo	From: , Olin EPA	Timothy Witm	late an	Note: If enclosures are not as noted, please contact us immediately.	



Wilmington Conservation Commission

March 30, 2007

121 Glen Road

Town Hall

15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 800-288-8123 Fax: 617-896-4301

Wilmington, MA 01887 Attn: Winifred McGowan www.bscgroup.com

Re:

Olin Corporation – DEP File #344-419

Weir Inspection Reports BSC Job #89241.00

Dear Commission,

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of March 2007. BSC conducted an inspection on Friday, March 30, 2007.

The resource areas appear to be in good condition. There has been no disturbance to the resource areas and no soil disturbing activities are occurring on site. For the most part the snow and ice has melted. The ground was frozen in many locations and a very thin layer of new ice was present at Stations H and I. In general, the typical colorations observed in the water and along the channel bottom were not as concentrated as observed during previous inspections conducted by BSC.

West Ditch Off-Property

Station A had approximately 6 to 7 inches of clear water. There was a thin layer of beige and orange/rust colored precipitate that has settled on the channel bottom. This precipitate was visible throughout the channel. Station B is located along the west ditch at the culvert leading under the railroad tracks to the Weir. The water at Station B was clear and the bottom was covered with leaves and mud. The water level was at .9 on the staff gauge. No precipitate was observed at Station B.

#### Weir

Station D, located up stream of the Weir had approximately 12 to 15 inches of clear water. The bottom was covered with rocks, leaves and mud. No precipitate was observed in this area.

Engineers

The Weir had a moderate volume of clear water flowing from the outlet pipe. There was no water observed flowing over the check dam from the on-property west ditch. The water below the Weir was slightly cloudy. The cloudy beige and greenish colored precipitate visible throughout the water column and was very faint compared to previous inspections conducted by BSC. The cloudy water was mostly concentrated just below the Weir and extended approximately 20 feet downstream. Some very light beige colored material has settled in small clusters along the channel bottom.

Environmental Scientists

**GIS Consultants** 

Landscape Architects

**Planners** 

Surveyors



#### Wetland Areas South of the South Ditch

Stations H and I both had approximately 2 to 3 inches of clear water with a thin layer of new ice on the surface. No precipitate was observed in these areas.

#### South Ditch Downstream of the Weir

Station E and Station F, located along the south ditch had a moderate volume of clear water flowing through the channel. There was a very faint orange/rust and beige colored precipitate that had settled onto the channel bottom. These colorations were grouped in small concentrated areas that spanned the entire length of the channel between Station E and Station F.

Station G, the delta area, also had a very faint beige color visible on the bottom of the channel.

Downstream from delta area at the haybale line, the water was clear. No precipitate was present in the water or on the channel bottom.

#### Wildlife

A variety of songs birds were observed throughout the site. Scat was observed along the path leading to Station G. The muskrat lodge was visible in the retention pond, however no muskrats were observed.

If you have any questions or need additional information please contact me at 617-896-4355.

Sincerely,

BSC Group, Inc.

Timothy R. Witman

Environmental Inspector

#### Enclosures:

cc:

Mr. Steve Morrow, Olin Corp.

Mr. Joe Coyne, DEP (Electronically)

Mr. Brian Guichard, Olin Corp.

Mr. Peter Thompson, MACTEC

Mr. Jim DiLorenzo, EPA

## Wilmington Site

Date	3/9/2007	Time	2:00pm	Inspectors	Frank Gay	
				. 757		

Station	Precipitate Observation		Other Observations
	Yes	No	
Offsite Fenced Ditch System			
Station A		x	Partially frozen, areas of clear water
Station B		x	Frozen over
Vest Ditch Foot Bridge			
Station C		x	Filled in
Veir - Upstream		1 miles 1700	3
Station D		x	Frozen over
Veir - Downstream	Podranie i Parlia		
Station E	х		Clear water, rust colored bottom
Station F	х	x Clear water, rust and gray bo	
Station G		x	Frozen over
Innamed Ditch		in the second	Frozen over
Station H		x	Frozen over
Station I		x	
Supplemental Inspection ocations (designate station ocation on page 2 of 2)			
staff Gauge Level	0.9ft		
Condition of Weir / Haybale B	arriers:		Medium flow from outlet, clear water with a
ust colored bottom. Small op	en area	near ou	utlet also with a rust colored bottom. No
ubbling events noticed.			
laybale area has clear water	flowing	through	the center of the haybale. Bottom is
nostly sand covered.			
Saw several species of birds	and lots	s of anin	nal tracks in the snow.
			The second secon

## Wilmington Site

Date	3/16/2007	Time	8:30 Inspectors	Frank Gay	

	SULTINGENDAL GENERALISM	pitate	
Station	Observation		Other Observations
The standard section is	Yes	No	
Offsite Fenced Ditch System			4.5 inches of clear water on top with a
Station A	Х		leaf covered bottom. Station B partially
Station B	0)	X	frozen, staff gauge 0.9'.
West Ditch Foot Bridge			
Station C		x	Filled in
Weir - Upstream	<b>美术基件</b>		Edges frozen over middle clear water
Station D		x	bottom leaves and rocks, 17" deep.
Weir - Downstream		646	Both stations E and F have clear water
Station E	х		with a rust colored bottom. Station G
Station F	x		mostly frozen over. Clear water on top
Station G		x	with a leaf covered bottom.
Unnamed Ditch		Steam artists at the	
Station H		х	Frozen over
Station I		x	Frozen over
Supplemental Inspection			
Locations (designate station location on page 2 of 2)			
Staff Gauge Level	0.9		
Condition of Weir / Haybale Ba			Clear water and medium flow from the
			area clear with a rust colored and black
			eart with a slightly murky and gray
bottom. Three bubbling events			art Hidi a onginiy marky and gray
			h the center of the haybale. Bottom is
	1000		in the center of the haybale. Bottom is
a mix of sand, leaves and brar	iches.		
			A STATE OF THE STA
and the same of th			

### Wilmington Site

Date	3/23/2007	Time	10:30 Inspectors	Frank Gay	
		-			

	Precipitate Observation Yes No		Other Observations
Offsite Fenced Ditch System			6" clear water with a leaf covered bottom,
Station A	х		beige colored precipitate in the center.
Station B		x	clear water bottom leaves and sand.
West Ditch Foot Bridge			
Station C		x	Filled in
Neir - Upstream			17.5"clear water bottom covered with
Station D		х	leaves and rocks.
Weir - Downstream			Station E and F both have clear water with
Station E	х		a grey and rust colored bottom.
Station F	х		Station G 7" clear water, bottom covered
Station G		x	with leaves and mud.
Unnamed Ditch			Clear water with a leaf covered bottom
Station H		x	Station I still frozen over.
Station I		x	
Supplemental Inspection  Locations (designate station ocation on page 2 of 2)			
Staff Gauge Level	0.9		
Condition of Weir / Haybale B	arriers:		Clear water from outlet pipe, medium flow
with a rust colored bottom. Ma	ain area	a is clou	dy with a clearer center area. Bottom is
rust and grey colored. Three b	oubblin	g events	noticed.
Haybale area has clear water	flowing	through	the center area, bottom is a mix of
sand and branches.			
		11	

### Wilmington Site

Date 3/30/07	Time	7:00.	Inspectors Tim Witman
Conditions: Partly akudy, temp 34°	F	. 577	Inspectors Tim Witman  BSC Grays
Station	Preci Obse	ipitate rvation No	Other Observations
Offsite Fenced Ditch System			6-7" of clar water to then has boise / rust
Station A	X		6-7" of clear water to Hum has boise / rust
Station B		X	water clear buttom leaves of much staffguese .9
West Ditch Foot Bridge			
Station C		x	Filled in
Weir - Upstream			Water clear buttom lower rocks much
Station D		X	
Weir - Downstream	auto de production de la companya d La companya de la companya della companya del		
Station E	X		moderate flow of class with being cobre on bottom
Station F	X		Very faints cions of being t d'enst colored precipatate
Station G	X		Sume beige autors peresenten the delta bottom
Unnamed Ditch			
Station H			1-3" of clear water, this layer of ice Bottom. 1-3' of clear water this layer fice leaves tomand
Station I			1-3' efector water this layer-fiel leaves + much
Supplemental Inspection			
Locations (designate station location on page 2 of 2)			
Staff Gauge Level			
Condition of Weir / Haybale Ba			moderate value of clour water from the outlet
pipe New water flaming over	check b	lam fire	in the on presently west ditch
Water below the west is s	1541/4	zloudy	and some granish substitution is present
- mustly concentrated near the	Weir	Inger.	and some greenish selection is present
inspections			
Clear water Flow through the	Jay Sal	lie no	procentate prosent
Check dams should be replaced	{		

RevD 07/06/07



Mr. Peter Thompson, MACTEC

### TRANSMITTAL

NOTE OF SE	Winifred McGowan mington Conservation Commission			Date: Proj. No:	July 2, 2007 89241.00		
121	Glenn Road			Project:	DEP File #334-419		
Wilr	nington, MA 01	887					
W	1:						
We are ser							
Attached		$\boxtimes$	Jnder Separate Cover				
Via: ☐ Overnigl ☐ Messeng	50	-	Taxi Direct from printer	⊠ Regular Mail □ Other:	j	33 Waldo Street Worcester, MA OI	
The follow  Change  Copy of  Digital M	Order Letter		Drawings Photocopies Plans	☐ Prints ☑ Reports ☐ Other:	Samples Specifications	Tel: 508-792-450 Fax: 508-792-450	
No. of Cop	ies Drawings	No.	Date or Revision	Description			
1			July 2, 2007	June Weir Rep	orts and Letter		
~							
10000-1000							
This inform For Your Uncheck Prelimin Revised Final Pla	Information ed ary Plans		Approved as submitted Approved as noted Disapproved Returned for corrections Sent for your review & co	☐ Resubm ☐ Return ☑ Submit mment	it copies for approval corrected prints copies for distribution		
Remarks:	Dear Ms. McC	owan	,				
	Attached is the	e weir	inspection reports for t	the Olin facility f	or June.		
	Please call me	at 61	7-896-4351 with any q	uestions.			
	Thank you.		-				
cc:	Mr. Steve Mor Mr. Joe Coyne Mr. Brain Gui Mr. Jim DiLor	, DEF	From:	Heather Vaillan	Vaillant	Note: If enclosures not as noted, please contact us immediat	



July 2, 2007

15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 800-288-8123 Fax: 617-896-4301

www.bscgroup.com

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

Re:

Olin Corporation – DEP File #344-419

Weir Inspection Reports BSC Job #89241.00

#### Dear Commission:

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of June 2007. BSC conducted an inspection on Thursday, June 28, 2007.

West Ditch Off-Property

Station A had approximately 3 inches of clear water. The bottom of the ditch was rust colored throughout with leaves covering the bottom.

Station B is located along the west ditch at the culvert leading under the railroad tracks to the weir. The water at Station B was clear. The channel bottom was rust colored and covered with leaves and mud.

#### Weir

Station D, located up stream of the weir had approximately 10 inches of clear water. The bottom was covered with rocks, leaves and mud. No precipitate was observed in this area.

There was a medium to low volume of clear water flowing from the weir outlet pipe. There was no water observed flowing from the on property west ditch. The water below the weir is cloudy with a green and beige coloration visible throughout the water column. The cloudy water extended downstream approximately 20 feet below the weir. Brown and green algae were observed growing in some areas, mostly along the edges. The channel bottom was covered with a very fine looking beige colored precipitate. This coloration was concentrated mostly up to the Engineers first check dam.

Wetland Areas South of the South Ditch

Stations H and I both were mostly dry. No precipitate was observed in these areas. Wetland vegetation, water-stained leaves, and saturated soil were observed.

South Ditch Downstream of the Weir

Station E and Station F, located along the south ditch, had a low volume of slightly cloudy to clear water flowing through the channel. Rust and beige colored streaks were observed throughout the channel bottom.

Environmental Scientists

**GIS Consultants** 

Landscape Architects

**Planners** 

Surveyors



Station G, the delta area, had very little water. The bottom had streaks of the rust colored precipitate. Water Arum plants were abundant in the delta.

Downstream of the delta area, near the haybale line, a low volume of clear water was flowing through the center of the haybale line.

#### Wildlife

A variety of songs birds were observed throughout the site. Frogs were observed at Station A, Station D, and the haybale line. A crayfish was observed downstream of the weir near Station F. The muskrat lodge was visible in the retention pond, however no muskrats were observed.

If you have any questions or need additional information please contact me at 617-896-4351.

Sincerely,

BSC Group, Inc.

Heather Vaillant

Environmental Planner

Enclosures:

06/08/2007 Inspection Report 06/15/2007 Inspection Report 06/22/2007 Inspection Report 06/28/2007 Inspection Report

CC:

Mr. Steve Morrow, Olin Corp.

Mr. Joe Coyne, DEP (Electronically) Mr. Brian Guichard, Olin Corp.

Mr. Peter Thompson, MACTEC

Mr. Jim DiLorenzo, EPA

\Bsc\.HYDRA\_PRJ0.Worcester.bsc\Prj\8924100\BSC Reports\Monthly Inspections\Weir 344-419\2007\June.doc

### Wilmington Site

Date	6/8/2007	Time	8:15AM	Inspectors	Brian Guichard	

Station	Precipitate Observation Yes No		Other Observations
Offsite Fenced Ditch System			Station A has clear pollen covered water on top with
Station A		x	a brown leaf covered bottom. Station B has pollen on
Station B		x	the surface with leaves and mud on the bottom.
West Ditch Foot Bridge		4	
Station C		x	Filled in
Weir - Upstream			Clear water with leaves, rocks, and mud on the
Station D		x	bottom.
Weir - Downstream			Stations E and F are clear water with a medium flow,
Station E	x		bottom is brown and rust colored. Station G has very
Station F	x		little pollen and algae covered water with mud on the
Station G	х		bottom.
Unnamed Ditch			Very little water with leaves and mud on the bottom.
Station H		x	
Station I		х	
Supplemental Inspection Locations (designate station location on page 2 of 2)			TI T
Staff Gauge Level	0.	8"	
Condition of Weir / Haybale Barriers: is rust colored. The main area is lightly	cloudy wi	· ·	Medium flow of clear water from the outlet pipe, bottom colored bottom. Brown and green algae is growing
in some areas, mostly along the edges.	One bub	bling even	t noticed. The bottom of the channel is mostly brown
throughout with some mild foaming just	after the	first check	dam.
The Haybale Line has a small flow of cle	ear water	flowing th	rough the center, the bottom is mostly brown and
muddy, Arrowheads are beginning to gr	ow and b	lock out vi	ewing a lot or the area before the Haybale area.
	18		
	***		
	1/4		

### Wilmington Site

Date	6/15/2007	Time _	9:15 Inspectors	Brian Guichard	

Station		pitate		
Station	Observation		Other Observations	
	Yes No			
Offsite Fenced Ditch System			Station A has clear water on top with decomposing	
Station A		х	leaves on the bottom. Station B is the same as stn.	
Station B		х	A.	
West Ditch Foot Bridge				
Station C		х	Filled in	
Weir - Upstream			Clear water on top with leaves and rocks on the	
Station D		x	bottom.	
Weir - Downstream			Stations E and F have a medium flow of cloudy	
Station E	x		water with a light brown colored bottom. Station G	
Station F	х		is difficult to see now, arrowheads have grown to a	
Station G	х		point where the water flow can no longer be seen.	
Unnamed Ditch			Stations H and I are mostly just mud and leaves.	
Station H		x		
Station I		x		
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level	0	.8		
Condition of Weir / Haybale Barriers:			Medium flow of clear water from the outlet pipe with a	
rust colored bottom. The main area is n	nostly clo	udy with a	gray/blue coloring. The bottom is light brown. Three	
bubbling events were noticed. The char	nnel is mo	ostly cloud	dy with a light brown bottom the entire length, and a	
minor amount of foaming just after the				
The Haybale line has a low flow of clear	r water flo	owing thro	ough the center.	
		-		
Volume to the second of the se				

### Wilmington Site

Date 6/22/2007 Time 10:00 Inspectors Brian Guichard	te	6/22/2007	Time	10:00 Inspectors	Brian Guichard
---	----	-----------	------	------------------	----------------

Station	Preci Obser	-	Other Observations	
	Yes	No		
Offsite Fenced Ditch System			Station A has leaves on the bottom with clear water	
Station A	Station A x		on top. Station B also has leaves on the bottom	
Station B	Station B		with clear water on top.	
West Ditch Foot Bridge				
Station C		х	Filled in	
Weir - Upstream			Clear water on top with leaves, rocks, and mud on	
Station D		х	the bottom.	
Weir - Downstream			Stations E and F have a medium flow of water that	
Station E	х		is slightly clearer than last week but still cloudy.	
Station F	x		Station G filled in with vegitation.	
Station G	х			
Unnamed Ditch			Station H is almost completely dry with mud. Station	
Station H		х	I is completely dry.	
Station I		x		
Supplemental Inspection				
Locations (designate station location on page 2 of 2)				
	-			
Staff Gauge Level		.8		
Condition of Weir / Haybale Barriers:			Medium flow of clear water from the outlet pipe with a	
			water in the main area. One bubbling event noticed.	
		s with a th	in layer of scum on the water surface. Also noticed	
animal scat on the foot bridge by the w	rier.			
Haybale line has very little clear water	flowing th	rough the	center.	

### Wilmington Site

Date 6/28/2007	Time 1:30pm	_Inspectors	Heather	Vaillant
			Diana W	alden

Precipitate						
Station		vation	Other Observations			
Ye		No				
Offsite Fenced Ditch System			St. A - = 3" of water; bottom rust-colored			
Station A		X	and covered with leaves. Frogs observed.			
Station B		X	St. B - Clear water; rust-rolored bottom			
West Ditch Foot Bridge						
Station C		x	Filled in			
Weir - Upstream			8-10" of water; water is clear			
Station D		X	, 02, 23			
Weir - Downstream			St. Eand F - low flow of clear			
Station E	X		water, beige and rusty precipitate.			
Station F	X		Frogs & Crayfish observed. St. G-			
Station G	X		Low water level; Arrow arum abundant			
Unnamed Ditch			Station HUI are dry Wetland			
Station H		X	regetation water-stained leaves			
Station I		X	and saturated soil were observed.			
Supplemental Inspection						
Locations (designate station location on page 2 of 2)						
Staff Gauge Level	D.	7				
Condition of Weir / Haybale Barriers:	0.	1				
	olaa-		0 0 1 1			
			er from Culvert. The water is			
Somewhat Cloudy 1)	with	a tar	and blue precipitate Green			
and brown algae u	vere c	growi	ng along edges. Bubbling			
events took place.						
		^ 1				
Haybale line-low f	Haybale line - low flow of clear water; beige deposit on					
bottom; some green	obse	rved i	on bottom			
		·				



### TRANSMITTAL

То: М	ls. Wini	fred McGowan		Date:	July 31, 2007	
-		on Conservation	Commission	– Proj. No:	89241.00	
-	21 Glen			Project:	DEP File #334-419	
.=	3000	on, MA 01887		_		
				-		
We are	177					
Attacl	hed		Jnder Separate Cover			
The second second				⊠ Regular Mail ☐ Other:	Ĭ.	33 Waldo Street Worcester, MA 01608 Tel: 508-792-4500
☐ Chan☐ Copy	The following items:  Change Order  Drawings  Copy of Letter  Photocopies  Plans		☐ Prints ☑ Reports ☐ Other:	☐ Samples ☐ Specifications	Fax: 508-792-4509	
No. of C	Copies	Drawings No.	Date or Revision	Description		
1			July 31, 2007	July Weir Rep	orts and Letter	
						Ť.
						11
Unch	formatic Your Info hecked Iminary sed Plans I Plans	ormation	Approved as submitted Approved as noted Disapproved Returned for corrections Sent for your review & co	∏ Resubn □ Return ⊠ Submit	corrected prints	
Remark	ks: De	ar Ms. McGowai	n,			
	Attached is the weir inspection reports for				for July.	
	Ple	ease call me at 61	7-896-4351 with any o	uestions.		
	Th	ank you.	A CONTRACTOR OF THE CONTRACTOR	- Traine and		
cc:	M: M:	r. Steve Morrow, r. Joe Coyne, DE r. Brain Guichard r. Jim DiLorenzo r. Peter Thompso	P From: I, Olin , EPA	Heathe Heather Vailla	y Vaillant	Note: If enclosures are not as noted, please contact us immediately.



July 31, 2007

15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 800-288-8123

Fax: 617-896-4301

www.bscgroup.com

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

Re:

Olin Corporation - DEP File #344-419

Weir Inspection Reports BSC Job #89241.00

#### Dear Commission:

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of July 2007. BSC conducted an inspection on Thursday, July 26, 2007.

West Ditch Off-Property

Station A had a low level of clear water. The bottom of the ditch was rust colored throughout with leaves covering the bottom.

Station B is located along the west ditch at the culvert leading under the railroad tracks to the weir. The water at Station B was clear. The channel bottom was rust colored and covered with leaves.

#### Weir

Station D, located up stream of the weir had approximately 10 inches of clear water. The bottom was covered with rocks, leaves and mud. No precipitate was observed in this area.

There was a moderate to low volume of clear water flowing from the weir outlet pipe. There was no water observed flowing from the on property west ditch. The water below the weir was cloudy with a blue-green and beige coloration visible throughout the water column. The cloudy water extended downstream approximately 20 feet below the weir. Brown and green algae were observed growing in some areas. The channel bottom was covered with a very fine beige-colored precipitate. This coloration was concentrated mostly up to the first check dam.

#### Wetland Areas South of the South Ditch

Stations H and I both were dry throughout the month. No precipitate was observed in these areas. Wetland vegetation, water-stained leaves, and saturated soil were observed.

#### South Ditch Downstream of the Weir

Station E and Station F, located along the south ditch, had a moderate to low volume of clear water flowing through the channel. The channel bottom was beige with streaks of rust coloration.

Engineers

Environmental Scientists

GIS Consultants

Landscape Architects

Planners

Surveyors



Station G, the delta area, had very little water. Water Arum plants were abundant in the delta.

Downstream of the delta area, near the haybale line, a low volume of clear water was flowing through the center of the haybale line.

#### Wildlife

A variety of songs birds were observed throughout the site. Two red-tailed hawks were observed near the haybale line. Frogs were observed at Station A, Station D, and downstream of the weir. Bullfrog tadpoles were observed upstream of the weir. The muskrat lodge was visible in the retention pond, however no muskrats were observed.

If you have any questions or need additional information please contact me at 617-896-4351.

Sincerely,

BSC Group, Inc.

Heather Vaillant

Environmental Planner

Enclosures:

07/06/2007 Inspection Report 07/13/2007 Inspection Report 07/20/2007 Inspection Report 07/26/2007 Inspection Report

cc:

Mr. Steve Morrow, Olin Corp.

Mr. Joe Coyne, DEP (Electronically) Mr. Brian Guichard, Olin Corp. Mr. Peter Thompson, MACTEC Mr. Jim DiLorenzo, EPA

P:\Prj\8924100\BSC Reports\Monthly Inspections\Weir 344-419\2007\July.doc

### Wilmington Site

Date	7/6/2007	Time	11:15 Inspectors	Brian Guichard	

Preci	pitate	
Obser	vation	Other Observations
Yes No		
Offsite Fenced Ditch System		Stations A and B have clear water on top with leaves
	x	on the bottom.
	X	
	X	Filled in
		Clear water with leaves, rocks and mud on the bottom
	x	
		Stations E and F have a medium flow of mostly clear
х		water. The bottom is light brown with some rust
x		colored areas.Station G has low flow with lots of
x		vegitation in the area.
		Stations H and I have no free standing water, but the
	х	ground is saturated from the previous days rain.
	х	
		4
0	9	
		Medium flow of clear water from the outlet pipe with a
learer tha	an last we	ek but still has bluish and beige coloring. The bottom
111-111	200000	nostly clear with a light beige colored precipitate along
, , , , o o i i		J Single Soloted Prodipitate along
r water fl	owing thr	ough the center
Water II	Ching till	ough the someth
֡֡֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜֜	X X X A X A A A A A A A A A A A A A A A	Yes No  X X X  X  X  X  X  A  A  A  A  A  A  A

## Wilmington Site

Date	7/13/2007	Time	12:00 Inspectors	Brian Guichard	
-					

Station		pitate vation	Other Observations
oution.	Yes	No	0.1101 0.0001 1.110110
Offsite Fenced Ditch System			Stations A and B both have clear water with
Station A		x	decomposing leaves on the bottom.
Station B		x	
West Ditch Foot Bridge		v:	
Station C		х	Filled in
Weir - Upstream			Clear water with leaves and rocks on the bottom.
Station D		х	
Weir - Downstream			Stations E and F have a medium flow of clear water.
Station E	х		The channel bottom is rust and beige colored from
Station F	х		the first check dam on. Station G is filled in with
Station G	х		vegetation.
Unnamed Ditch			Stations H and I are dry.
Station H		x	
Station I		х	
Supplemental Inspection Locations (designate station location on page 2 of 2)			
Staff Gauge Level	0.	.6"	
Condition of Weir / Haybale Barriers:			There is a medium flow of clear water from the outlet
pipe with a rust colored bottom. The ma	ain area i	s mostly c	lear with light bluish precipitate suspended in the water
The bottom is covered with blue and be	ige preci	pitate up t	to the first check dam. There is also some mild foaming
just beyond the dam.			
The Haybale line has a low flow of clea	r water fl	owing thro	ough the center.
Note: noticed two Red Tailed Hawks fly	ing arou	nd the are	a this week instead of the usual one.
***************************************			
		- California	A STATE OF THE STA

## Wilmington Site

Date	7/20/2007	Time	10:00 Inspectors	Brian Guichard	
				Leroy Johnson	

		Preci	pitate			
	Station		vation	Other Observations		
		Yes No		The ship of the seal of the state of the sta		
Offsite Fen	ced Ditch System			Stations A and B have clear water on top with leaves		
	Station A		x	on the bottom.		
	Station B		х			
West Ditch	Foot Bridge					
	Station C		х	Filled in		
Weir - Upst	ream			Lightly amber colored from rainwater flow disturbing		
	Station D		х	decomposing leaves on the bottom.		
Weir - Dow	nstream			Stations E and F have a medium flow of clear water.		
	Station E	x		The bottom is mostly beige colored precipitate with		
	Station F	х		areas of rust coloration. Station G is mostly filled in		
	Station G	х		with vegetation.		
Unnamed D	Ditch			Station H is mostly water saturated soil with leaves		
	Station H		х	on the surface. Station I is a little less saturated than		
	Station I		X	station H, but otherwise the same.		
The result of the same of the	ital Inspection					
100	(designate station					
	page 2 of 2)					
Staff Gauge	e Level	0	.7"			
Condition of W	leir / Haybale Barriers:			There is a medium flow of clear water from the outlet		
pipe with a rus	t and green algae covere	ed botton	n. The ma	ain area is lightly cloudy with a blue/gray colored		
precipitate. Th	e bottom of the main are	a is mos	tly covere	d with a beige colored precipitate with areas of blue/		
green colored	green colored precipitate. The channel has a medium flow of clear water and has a beige colored precipitate along					
the bottom wit	the bottom with areas of a rust coloration. There is some mild foaming after the first check dam.					
The Haybale li	ine has a medium flow of	f clear wa	ater flowin	ig through the center.		
-	The second secon					

### Wilmington Site

# Interim Action Plan South and West Ditch Precipitate Inspection Report

Date 7/26/2007 Time 12: Wpm Inspectors Heather Vaillant

Station	Station Precipitate Observation Yes No		Other Observations		
Offsite Fenced Ditch System			A-Push cal-add 1-11-		
Station A ×		V	A-Rust colored bottom, covered		
Station B		X	B-Clear water rust-colored bottom		
West Ditch Foot Bridge			O CHES GOOD TWIST TOTAL BOTTOM		
Station C		х	Filled in		
Weir - Upstream			clear water, leaf covered bottom		
Station D		X	bullfrog tadpoles obs.		
Weir - Downstream		EI	F-tan-colored bottom, clear		
Station E	X		water Slow to moderate flow,		
Station F	X		frogs obs. G-low water level.		
Station G	*		arrow arum abundant		
Unnamed Ditch			H-Dry no standing water surface		
Station H		X	appears saturated, wetland veg. pres		
Station I		*	I-Same		
Supplemental Inspection Locations (designate station location on page 2 of 2)					
Staff Gauge Level	$\sim$ $\iota$	0,5			
Condition of Weir / Haybale Barriers:		'n			
Weir-blue-green water color, tan precipitate on bottom, water somewhat cloudy, green algae growing on surface, Some bubbling occurred frogs obs. Low flow of clear water from culvert.  Haybale line-clear water, low flow, dark brown					
bottom					



### TRANSMITTAL

To: Ms. V	/inifred McGowa	n	Date:	September 6, 2007	
Wilm	ington Conservati	ion Commission	Proj. No:	89241.00	
121 0	ilenn Road		Project:	DEP File #334-419	
_Wilm	ington, MA 0188	7			
We are send	ling you:				
Me are sent	inig you. I	Under Separate Cover			
Mitacircu	L	_ Onder separate sever			
Via:  ☐ Overnigh ☐ Messenge		☐ Taxi ☐ Direct from printer	Regular Mail		33 Waldo Street Worcester, MA 0160
2010			-		Tel: 508-792-4500
The following Change Copy of Lopy Digital M	etter [	☐ Drawings ☐ Photocopies ☐ Plans	☐ Prints ☐ Reports ☐ Other:	☐ Samples ☐ Specifications	Fax: 508-792-4509
No. of Copi	es Drawings No	Date or Revision	Description		
1		September 4, 200	7 August Weir F	Reports and Letter	
0					
This inform For Your Unchecke Prelimina Revised F	Information ed ry lans	<ul><li>□ Approved as submitte</li><li>□ Approved as noted</li><li>□ Disapproved</li><li>□ Returned for correctio</li><li>□ Sent for your review &amp;</li></ul>	☐ Return ☐ Submit	corrected prints	
Remarks:	Dear Ms. McGov	van,			
	Attached is the v	veir inspection reports	for the Olin facility	for August.	
	Please call me at	617-896-4351 with ar	ny questions.		
	Thank you.		- 324////104/// - 24-24-2		
cc:	Mr. Steve Morro Mr. Joe Coyne, I Mr. Brain Guich Mr. Jim DiLorer Mr. Peter Thom	DEP From lard, Olin lazo, EPA		y Vaillant	Note: If enclosures ar not as noted, please contact us immediately



providing solutions that create value

15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 800-288-8123 Fax: 617-896-4301

www.bscgroup.com

September 4, 2007

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

Re:

Olin Corporation – DEP File #344-419

Weir Inspection Reports BSC Job #89241.00

#### Dear Commission:

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of August 2007. BSC conducted an inspection on Thursday, August 30, 2007.

West Ditch Off-Property

Station A had very little standing water during the month of August. The bottom of the ditch was rust colored throughout with leaves covering the bottom.

Station B is located along the west ditch at the culvert leading under the railroad tracks to the weir. The water at Station B was clear. The channel bottom was rust colored and covered with leaves and mud.

#### Weir

Station D, located up stream of the weir had approximately 6 inches of clear water. The bottom was covered with rocks, leaves and mud. No precipitate was observed in this area.

There was a low volume of clear water flowing from the weir outlet pipe. There was no water observed flowing from the on property west ditch. The water below the weir is somewhat cloudy with a green and beige coloration visible throughout the water column. The cloudy water extended downstream approximately 20 feet below the weir. Green algae was observed growing in along the bottom. The channel bottom was covered with a very fine looking beige colored precipitate. This coloration was concentrated mostly up to the first check dam.

Wetland Areas South of the South Ditch

Stations H and I both were mostly dry. No precipitate was observed in these areas. Wetland vegetation, water-stained leaves, and saturated soil were observed.

South Ditch Downstream of the Weir

Station E and Station F, located along the south ditch, had a low volume of clear water flowing through the channel. Rust and beige colored streaks were observed throughout the channel bottom.

Engineers

Environmental Scientists

**GIS Consultants** 

Landscape Architects

**Planners** 

Surveyors



Station G, the delta area, had very little water. Water Arum, Purple Loosestrife, and Jewelweed were abundant in the delta.

Downstream of the delta area, near the haybale line, a low volume of clear water was flowing through the center of the haybale line throughout most of the month. During the last week of the month, this area was dry.

#### Wildlife

A variety of songs birds were observed throughout the site. Frogs were observed at Station A, Station E, and Station F. Many aquatic insects were present at the weir and in the channel downstream. A snake was observed near the channel. Three turtles were observed at the site. Raccoon tracks were observed near the haybale line.

If you have any questions or need additional information please contact me at 617-896-4351.

Sincerely,

BSC Group, Inc.

Heather Vaillant

Environmental Planner

Enclosures:

08/03/2007 Inspection Report 08/10/2007 Inspection Report 08/17/2007 Inspection Report 08/24/2007 Inspection Report 08/30/2007 Inspection Report

cc:

Mr. Steve Morrow, Olin Corp. Mr. Joe Coyne, DEP (Electronically) Mr. Brian Guichard, Olin Corp. Mr. Peter Thompson, MACTEC Mr. Jim DiLorenzo, EPA

P:\Prj\8924100\BSC Reports\Monthly Inspections\Weir 344-419\2007\August.doc

## Wilmington Site

Date	8/3/2007	Time	14:15 Inspectors	Brian Guichard	
Water Control		10.1		Leroy Johnson	

Station	Precipitate Observation		Other Observations
	Yes No		
Offsite Fenced Ditch System			Station A has very little water left, area mostly
Station A		х	decaying leaves. Station B has clear water on top
Station B		х	with leaves on the bottom.
West Ditch Foot Bridge			
Station C		х	Filled in
Weir - Upstream			Clear water with leaves and rocks on the bottom.
Station D		x	
Weir - Downstream			Stations E and F have a low flow of clear water with
Station E	х		a brown and rust colored bottom. Station G is over-
Station F	х		grown with vegetation.
Station G	х		
Unnamed Ditch			Stations H and I are dry.
Station H		х	
Station I		х	
Supplemental Inspection			
Locations (designate station location on page 2 of 2)			
Staff Gauge Level	0	0.6	
Condition of Weir / Haybale Barriers:			Light flow of clear water from the outlet pipe with a rust
colored bottom. The main area is lightly	y cloudy,	the bottor	m is mostly beige and brown with areas of blue. The
channel is clear with a brown and rust	colored b	ottom. Th	ere is some green algae growing on the bottom in some
areas. There is some mild foaming just	t beyond	the first cl	heck dam.
The Haybale line has a low flow of clea	r water.		
-			
	- Collins		

### Wilmington Site

Date	8/10/2007	Time	9:15 Inspectors	Leroy Johnson	
-					

Station	Precipitate Observation Yes No		Other Observations	
			Care, Coor varions	
Offsite Fenced Ditch System			Stations A and B have clear water on top with leaves	
Station A		x	on the bottom.	
Station B		x		
West Ditch Foot Bridge				
Station C		x	Filled in	
Weir - Upstream			Clear water with leaves and rocks on the bottom.	
Station D		x		
Weir - Downstream			Stations E and F have a low flow of clear water with	
Station E	х		a brown and rust colored bottom. Station G is filled	
Station F	х		in with vegetation.	
Station G	х			
Unnamed Ditch			Stations H and I are both saturated, but have no	
Station H		x	free standing water.	
Station I		x		
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level	C	),5		
Condition of Weir / Haybale Barriers:			There is a medium flow of clear water from the outlet	
pipe with a rust colored bottom. The ma	ain area i	is clear wit	h a brown and rust colored bottom, and some small	
areas of blue. The channel is clear with	a brown	and rust o	colored bottom. There is some mild foaming just	
beyond the 3rd check dam.				
The Haybale line has a low flow of clea	r water.			

### Wilmington Site

Date	8/17/2007	Time	10:20 Inspectors	Brian Guichard	
		_			

Station	Precipitate Observation Yes No		Other Observations
Offsite Fenced Ditch System			Station A has very little water, with decaying leaves
Station A		x	on the bottom. Lots of frogs around the area. Station
Station B		х	B has clear water on top with leaves on the bottom.
West Ditch Foot Bridge			
Station C		х	Filled in
Weir - Upstream			Clear water with leaves and rocks on the bottom.
Station D		х	
Weir - Downstream			Stations E and F have a low flow of clear water with
Station E	х		a light brown and rust colored bottom. Station G is
Station F	х		overgrown with vegetation.
Station G		х	
Unnamed Ditch			Stations H and I are dry.
Station H		х	
Station I		х	
Supplemental Inspection Locations (designate station location on page 2 of 2)			
Staff Gauge Level	0	.5	
Condition of Weir / Haybale Barriers:			Medium flow of clear water from the outlet pipe, the
The second secon			ks with some green algae. The main area is mostly
clear, the bottom is beige and light brow	wn with s	ome areas	s of blue near the center. The beige coloration extends
up to the first check dam. The remaind	er of the	channel is	s clear with a brown and rust colored bottom.
The Haybale line has a low flow of clea	r water fl	owing thro	ough the center.
Markhara			

### Wilmington Site

Date	8/24/2007	Time	9:00 Inspectors	Leroy Johnson	

Station		pitate	040		
Station	Observation		Other Observations		
0% !! 5   151/10	Yes	No			
Offsite Fenced Ditch System			Station A has little water remaining, mostly decaying		
Station A		х	leaves. Station B has clear water on top with leaves		
Station B		х	on the bottom.		
West Ditch Foot Bridge					
Station C		x	Filled in		
Weir - Upstream			Clear water with leaves and rocks on the bottom.		
Station D		x			
Weir - Downstream			Stations E and F have a medium flow of clear water		
Station E	x		with a light brown and rust colored bottom. Station		
Station F	x		G cannot be seen because of vegetation.		
Station G		x			
Unnamed Ditch			Station H is soft and muddy with no free standing		
Station H		Х	water. Station I is dry.		
Station I		x			
Supplemental Inspection Locations (designate station location on page 2 of 2)					
Staff Gauge Level	0.	.5			
Condition of Weir / Haybale Barriers:			Medium flow of clear water from the outlet pipe, the		
bottom is rocks with some algae growin	g on ther		ain area is mostly clear, the bottom is beige and		
			g events. The channel has a medium flow of clear		
			e mild foaming after the first check dam.		
The Haybale line has a low flow of clear					
Noticed one snake on the path near sta	tion F, or	ne large tu	artle in the water at station D, and two medium sized		
turtles resting on the rocks in the basin		7,	-		
3					
Section 1 to 1					

Wilmington Site

# Interim Action Plan South and West Ditch Precipitate Inspection Report

Date 8/30/2007 Time 8:30 am Inspectors Heather Vaillant

Otation.	and the same of	pitate	Other Olement in a				
Station	Observation		Other Observations				
	Yes	No					
Offsite Fenced Ditch System			A-very little water bottom is saturated				
Station A		X	- covered with leaves				
Station B		X	B-clear water, leaves on bottom				
West Ditch Foot Bridge							
Station C		X	Filled in				
Weir - Upstream			clear water, ~6" in depth,				
Station D		X	bottom rovered w leaves rocks + much				
Weir - Downstream			Edf-low flow of clear water				
Station E	X		brown bottom w/ beige & rust				
Station F	X		precipitate. Frags obs. G-full of				
Station G			arrow arum, p. 100se strife, a jewelweed				
Unnamed Ditch	30	,	unable to observe if prec. is present due to thick ness of vegetation.				
Station H			HAI - dry Ground appears				
Station I			saturated. Wetland veg. present.				
Supplemental Inspection							
Locations (designate station							
location on page 2 of 2)		<del>                                     </del>					
Staff Gauge Level	0.	4					
Condition of Weir / Haybale Barriers:			Secretary and the secretary secretar				
Weir-moderate flow	of c	lear	water from outlet pipe. Water				
is somewhat claus	tu w	al bli	ue + tan precipitate. Several frogs				
Discount Many (10	11/11/11		sects present. Some green				
observed. Many ag	uan		SECTION SOLLEGIER				
algae growing or	the	DE DE	Hom. Some foam Observed,				
algae growing on the bottom. Some foam observed, mostly concentrated near first check dam.							
9							
Haubale line - Are	ais	dru	bottom is dark brown.				
Barcon tracks D	esen-	+ J	, bottom is dark brown.				
The case of	4,010						



### TRANSMITTAL

To: Ms. Wi	nifred McGow	an		_ Date:	October 10, 2007		
Wilmin	gton Conserva	tion	Commission	Proj. No:	89241.00		
121 Gle	enn Road			Project:	DEP File #334-419		
Wilmin	gton, MA 0188	37		=			
We are sendi	ng you:		A 45 A				
		∐ t	Jnder Separate Cover			0	
Via:						33 Walc	do Street
Overnight I	Delivery	_	axi [axi	Regular Mail		1942-00-00-00-00-00-00-00-00-00-00-00-00-00	ster, MA 0160
☐ Messenger			Direct from printer	Other:		Tel:	508-792-4500
The following	ritems.						508-792-4500
Change Or	SC - 200 - 20 T - 10		Drawings	Prints	☐ Samples	December 3	
Copy of Let	ter	and the same of th	Photocopies	□ Reports	☐ Specifications		
☐ Digital Med	ia		Plans	Other:			
No. of Copies	Drawings N	lo.	Date or Revision	Description			
1			October 8, 2007	September We	eir Reports and Letter		
. <del></del>							
This informa  For Your Ir  Unchecked  Preliminary  Revised Pla	nformation , , ns		Approved as submitted Approved as noted Disapproved Returned for corrections Sent for your review & co	☐ Resubm ☐ Return ☑ Submit mment	corrected prints		
Remarks: I	Dear Ms. McGo	wan	i,				
	Attached is the	weii	inspection reports for	the Olin facility	for September.		
2 <del></del>			7-896-4351 with any q				
-	Γhank you.						
- 1 - 2 - 2	Mr. Steve Morr Mr. Joe Coyne, Mr. Brain Guic Mr. Jim DiLore	DEI hard nzo,	From: I, Olin	Kloath L Heather Vaillan	u Vaillant	not as r	If enclosures ar noted, please us immediately
	Mr. Peter Thor					3-88/4/32/76	ments schalder 2000



15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 800-288-8123

Fax: 617-896-4301

www.bscgroup.com

October 8, 2007

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

Re:

Olin Corporation – DEP File #344-419 Weir Inspection Reports - September 2007 BSC Job #89241.00

#### Dear Commission:

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of September 2007. BSC conducted an inspection on Friday, September 28, 2007.

West Ditch Off-Property

Station A had a low water level and was dry at times during the month of September. The bottom of the ditch was rust colored and had leaves covering the bottom.

Station B is located along the west ditch at the culvert leading under the railroad tracks to the weir. The water at Station B was clear. This area also had a low water level during the month. The channel bottom was brown in color and covered with leaves and mud.

Station D, located up stream of the weir had approximately 6 inches of clear water. The bottom was covered with rocks, leaves and mud. No precipitate was observed in this area.

There was low flow of clear water from the weir outlet pipe during most of the month of September. At the end of the month, there was no flow from the outlet pipe. There was no water observed flowing from the on property west ditch. The water below the weir was mostly clear with a green and beige coloration visible throughout the water column. Green algae was observed growing along the bottom. The channel bottom was covered with a fine, beigecolored precipitate. This coloration was concentrated mostly up to the first check dam.

Engineers

Scientists

#### Wetland Areas South of the South Ditch

There was no standing water observed at Stations H and I throughout the month. The soil was saturated and wetland vegetation was present. No precipitate was observed in these areas.

**GIS Consultants** 

Environmental

#### South Ditch Downstream of the Weir

Station E and Station F, located along the south ditch, had a low volume of clear water flowing Architects through the channel. Rust and beige colored precipitates were observed on the channel bottom. Green algae was observed growing along the sides of the channel.

Landscape

Planners

Surveyors



Station G, the delta area, had very little standing water. Near the end of the month, a seasonal die-back of the vegetation was observed.

The area downstream of the delta area, near the haybale line, was dry throughout the month.

#### Wildlife

A variety of songs birds were observed throughout the site. Frogs were observed at Stations A, B, D, E, and F. Aquatic insects were present at the weir and in the channel downstream. A turtle was observed a station D. Deer tracks were observed near the haybale line.

If you have any questions or need additional information please contact me at 617-896-4351.

Sincerely,

BSG Group, Inc.

Heather Vailland
Heather Vailland

Environmental Planner

Enclosures:

09/07/2007 Inspection Report 09/14/2007 Inspection Report 09/21/2007 Inspection Report 09/28/2007 Inspection Report

cc:

Mr. Steve Morrow, Olin Corp.

Mr. Joe Coyne, DEP (Electronically)

Mr. Brian Guichard, Olin Corp.

Mr. Peter Thompson, MACTEC

Mr. Jim DiLorenzo, EPA

P:\Prj\8924100\BSC Reports\Monthly Inspections\Weir 344-419\2007\September.doc

### Wilmington Site

Date	9/7/2007	Time	10:00	Inspectors	Leroy	Johnson	

Station	Preci Obser	pitate vation	Other Observations
	Yes	No	
Offsite Fenced Ditch System			Station A has no standing water remaining, Station
Station A		х	B has some dry areas and some areas with a little
Station B		х	water remaining.
West Ditch Foot Bridge			
Station C		x	Filled in
Weir - Upstream			Clear water with some lightly cloudy areas along the
Station D		x	edges.
Weir - Downstream			Stations E and F have a low flow of clear water with
Station E	х		a light brown and rust colored bottom. Station G is
Station F	x		overgrown with vegetation.
Station G		x	
Unnamed Ditch			Station H is soft with no free standing water. Station
Station H		x	I is dry.
Station I		x	
Supplemental Inspection Locations (designate station location on page 2 of 2)			
Staff Gauge Level			
Condition of Weir / Haybale Barriers:			Medium flow of clear water from the outlet pipe, the
bottom is clean and rocky. The main ar	ea is mos	stly clear,	with a beige and light brown bottom. There are some
small areas of blue. The channel has a	low flow	of clear w	rater with a brown and rust colored bottom.
The haybale line has no flow.			
Noticed one medium sized turtle swimr	ning in th	e water at	t station D

### Wilmington Site

Date	9/14/2007	Time	10:30	Inspectors	Brian Guichard	

Station	A STATE OF THE STA	pitate	Other Observations
Station		vation	Other Observations
05.14	Yes	No	
Offsite Fenced Ditch System	227 - 20224		Station A has 1-2 inches of clear water in the center,
Station A		х	the edges are just wet leaves. Station B has clear
Station B		х	water on top with leaves on the bottom.
West Ditch Foot Bridge			The second of th
Station C		x	Filled in
Weir - Upstream	WITTER TO THE TOTAL THE		
Station D		х	Clear water with rocks and leaves on the bottom.
Weir - Downstream			Very low flow of clear water with a light brown and
Station E	х	in the second	rust colored bottom Station G is overgrown with
Station F	х		vegetation.
Station G		x	
Unnamed Ditch			Both stations H and I are saturated with no free
Station H		х	standing water.
Station I		x	
Supplemental Inspection			
Locations (designate station			
location on page 2 of 2)			
Staff Gauge Level			
Condition of Weir / Haybale Barriers:		1.00 m	ow flow of clear water from the outlet pipe with a rock
covered bottom. The main area is most	ly clear w	ith a light l	brown bottom and some small areas of blue. The
channel has a low flow of clear water w	ith a light	brown col	ored bottom
There is no flow at the Haybale line.			
25-1-13-2-7-18-4-3-12-7-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-			
			A CONTRACTOR OF THE CONTRACTOR
The state of the s		300 K	The state of the s

### Wilmington Site

Date	9/21/2007	Time	8:30 Inspectors	Leroy Johnson

Station		pitate vation	Other Observations	
	Yes	No		
Offsite Fenced Ditch System	Offsite Fenced Ditch System		Station A has a few small puddles standing water,	
Station A		x	the edges are just wet leaves. Station B has about 3	
Station B	7	x	inches of water on top with leaves on the bottom.	
West Ditch Foot Bridge		× = 40000		
Station C		x	Filled in	
Weir - Upstream			Clear water with rocks and leaves on the bottom.	
Station D	3	х		
Weir - Downstream			Stations E and F have a very low flow of clear water	
Station E	х		with a brown and rust colored bottom. Station G is	
Station F	х		overgrown.	
Station G		x		
Unnamed Ditch			Station H is saturated soil. Station I is a little bit	
Station H		×	drier than H, but still moist.	
Station I		х		
Supplemental Inspection Locations (designate station				
location on page 2 of 2)				
Staff Gauge Level	- <del>/</del>			
Condition of Weir / Haybale Barriers:	<u></u>	1	Low flow of clear water from the outlet pipe with a clean	
	th a light		tom and some small areas of blue. The channel has	
a low flow of clear water with a brown of				
The Haybale line has no flow.	0.0.00		NO. OF REAL PROPERTY OF THE PR	
The Haybare line has no non.			Auro en ministra de la composición dela composición de la composición de la composición de la composición dela composición dela composición dela composición de la composición de la composición de la composición de la composición dela composición de la composición dela composición dela composición dela composición dela composición dela composición dela	
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			and the special contract the second	

Wilmington Site

# Interim Action Plan South and West Ditch Precipitate Inspection Report

Date 9/27/2007 Time 8:00 am Inspectors Heather Vaillant

Station		pitate vation	Other Observations			
Ye		No	· ·			
Offsite Fenced Ditch System			A-Some Standing water bottom is			
Station A		X	rust-colored & covered w/ leaves			
Station B		X	B-clear water, leaves on bottom; Fragsa			
West Ditch Foot Bridge			both Statio			
Station C		х	Filled in			
Weir - Upstream			Clear water- ~6" indepth, Frogs			
Station D		X	obs.			
Weir - Downstream			E+F-low flow of clear water, brown			
Station E	X		bottom w/ green algae & beige & rust			
Station F	X		precipitate G-vegetation beginning			
Station G	V	Χ	to die back (seasonal), no standing water			
Unnamed Ditch			HaI - dry/no Standing water			
Station H		X	Saturated Soil, wetland veg.			
Station I		Χ	present			
Supplemental Inspection						
Locations (designate station location on page 2 of 2)						
Staff Gauge Level	0.5					
Condition of Weir / Haybale Barriers:			Weir - no flow from outlet pipe.			
Water is mostly clea	ir w		due-green precipitate & tan			
			nt on the bottom. Some aquatic			
insects observed	but	fewe	- than last month. One bubbling			
event observed.		12001				
Haybale line - Area was dry Deer track observed in						
mid			J			
*E4F-Several from	15 ob	serve	ed			
	)		STREET, CONTROL OF THE CONTROL OF TH			



### TRANSMITTAL

Wilm 121 (	Vinifred McGovington Conservillenn Road lington, MA 018	ation	Commission  Jnder Separate Cover	_ Date: _ Proj. No: _ Project: _	November 9, 2007 89241.00 DEP File #334-419		
Via:  Overnighthing Messenge  The following Change Copy of Letter Digital Messenge	r ng items: order etter		Faxi Direct from printer Drawings Photocopies Plans	□ Regular Mail     □ Other:     □ Prints     □ Reports     □ Other:	Samples Specifications		do Street ester, MA 01608 508-792-4500 508-792-4509
No. of Copi	es Drawings	No.	Date or Revision	Description			
1			October 30, 2007	October Weir	Reports and Letter		
<del></del>	·			- Andrews	*		
This inform  For Your  Uncheck  Prelimina  Revised F	Information ed ry Ilans		Approved as submitted Approved as noted Disapproved Returned for corrections Sent for your review & co	☐ Resubm ☐ Return ☑ Submit mment	it copies for approval corrected prints copies for distribution		
Remarks:	Dear Ms. McG	iowar	,				
	Attached is the	e wei	inspection reports for	the Olin facility	for October.		
,		at 61	7-896-4351 with any q	uestions.			
į	Thank you.			SI SI			
cc:	Mr. Steve Mon Mr. Joe Coyne Mr. Brain Gui Mr. Jim DiLon Mr. Peter Tho	e, DE charc enzo	From: , Olin EPA	Heather Vaillar	1 Vaillant	not as	If enclosures are noted, please at us immediately.



October 30, 2007

15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 800-288-8123

Fax: 617-896-4301

www.bscgroup.com

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Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

Re:

Olin Corporation - DEP File #344-419

Weir Inspection Reports BSC Job #89241.00

#### Dear Commission:

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of October 2007. BSC conducted an inspection on Friday, October 26, 2007.

West Ditch Off-Property

Station A had a low water level throughout most of the month. The bottom of the ditch was rust colored with leaves covering the bottom.

Station B is located along the west ditch at the culvert leading under the railroad tracks to the weir. The water observed at Station B was clear. The channel bottom was rust colored and covered with leaves.

#### Weir

Station D, located up stream of the weir had several inches of clear water. The bottom was covered with rocks and leaves. There was no precipitate observed in this area.

Clear water was flowing from the weir outlet pipe during most of the month. There was no water observed flowing from the on property west ditch. The water below the weir was slightly cloudy to clear with a green and beige coloration visible throughout the water column. Green algae were observed growing along the bottom. The channel bottom was covered with a beige-colored precipitate. This coloration was concentrated mostly up to the first check dam.

#### Wetland Areas South of the South Ditch

No standing water was observed at Stations H and I during the month of October. Wetland vegetation, water-stained leaves, and saturated soil were observed.

#### South Ditch Downstream of the Weir

Station E and Station F, located along the south ditch, had a low volume of clear water flowing through the channel. Rust and beige colored streaks were observed throughout the channel bottom.

Engineers

Environmental Scientists

**GIS Consultants** 

Landscape Architects

Planners

Surveyors



Station G, the delta area, had some flow of water near the beginning of the month and standing water near the end of the month. The vegetation that was previously covering this area has died back for the season.

A low volume of clear water was flowing through the center of the haybale line, located downstream of the delta area, in the beginning of the month. Near the end of the month, standing water was present without any noticeable flow.

#### Wildlife

A variety of songs birds were observed throughout the site.

If you have any questions or need additional information please contact me at 617-896-4351.

Sincerely,

BSC Group, Inc.

Heather Vaillant

Environmental Planner

#### Enclosures:

10/05/2007 Inspection Report 10/12/2007 Inspection Report 10/19/2007 Inspection Report 10/26/2007 Inspection Report

CC:

Mr. Steve Morrow, Olin Corp.

Mr. Joe Coyne, DEP (Electronically)

Mr. Brian Guichard, Olin Corp.

Mr. Peter Thompson, MACTEC

Mr. Jim DiLorenzo, EPA

\\Bsc\.HYDRA\_PRJ0. Worcester.bsc\Prj\\8924100\B5C Reports\Monthly Inspections\Weir 344-419\\2007\October.doc

### Wilmington Site

Date	10/5/2007	Time _	13:30 Inspectors	Leroy Johnson	

Station		pitate vation	Other Observations
	Yes No		Curer Observations
Offsite Fenced Ditch System			Station A has no water, just saturated soil, the
Station A		х	edges are just wet leaves. Station B has clear
Station B		х	water on top with leaves on the bottom.
West Ditch Foot Bridge			Auto-co
Station C		х	Filled in
Weir - Upstream			Clear water with rocks and leaves on the bottom.
Station D		х	
Weir - Downstream			Stations E and F have a very low flow of clear water
Station E	х		with a brown and rust colored bottom. The vegetation
Station F	x		that was blocking the view in station G is beginning
Station G		х	to recede due to the cooler night temps.
Unnamed Ditch			Station H is saturated soil. Station I is much drier
Station H		х	than H but still moist.
Station I		х	
Supplemental Inspection Locations (designate station location on page 2 of 2)			
Staff Gauge Level			
Condition of Weir / Haybale Barriers:		72	Trickle of clear water from the outlet pipe with a clean
rocky bottom. The main area is mostly of	covered v	-	
The Haybale line has very little flow of c			
			CONTRACTOR OF CHARACTER CONTRACTOR OF CONTRA
1.000			
			Control of the Contro
		<del></del>	

### Wilmington Site

Date	10/12/2007	Time	10:00 Inspectors	Leroy Johnson	
		_			

Station	Precipitate Observation		Other Observations
Ye		No	
Offsite Fenced Ditch System			Station A has a few inches of clear water with leaves
Station A		х	on the bottom. Station B has clear water on top
Station B		х	with leaves on the bottom.
West Ditch Foot Bridge			
Station C		х	Filled in
Weir - Upstream			Clear water with leaves and rocks on the bottom.
Station D		х	
Weir - Downstream			Stations E and F have a medium flow of clear water
Station E	х		with a brown and rust colored bottom. The stream
Station F	х		through station G is more visible now and has a
Station G		х	medium flow of clear water.
Unnamed Ditch			Stations H and I are both saturated with water.
Station H		х	
Station I		х	
Supplemental Inspection Locations (designate station location on page 2 of 2)			
Staff Gauge Level			
Condition of Weir / Haybale Barriers:	7.		There is a medium flow of clear water from the outlet
pipe with a rocky bottom. The main are	a has cle	ar water	on top with a beige colored precipitate and areas of
blue and green. No scum or foam notice	ed this w	eek and t	the water bugs are not as abundant.
The Haybalee line has a medium flow of	of clear w	ater.	
The state of the s			

## Wilmington Site

Date	10/19/2007	Time _	11:30 Inspectors	Brian Guichard	

Station	Precipitate Observation		Other Observations	
	Yes	No		
Offsite Fenced Ditch System			Stn. A has a few small puddles of clear water in the	
Station A		x	center, area mostly decaying and newly fallen leaves.	
Station B		х	Stn B has clear water on top with leaves on the bottom	
West Ditch Foot Bridge				
Station C		x	Filled in	
Weir - Upstream			Clear water with leaves and rocks on the bottom.	
Station D		х		
Weir - Downstream			Stations E and F have almost no flow, the bottom is	
Station E	х		brown and lots of newly fallen leaves.	
Station F	х		Station G has no noticeable flow.	
Station G		x		
Unnamed Ditch			Stations H and I are just moist soil with newly fallen	
Station H		х	leaves.	
Station I		х		
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level				
Condition of Weir / Haybale Barriers:		1	There is no flow from the outlet pipe. The main area is	
lightly cloudy with a little scum on the wa	ater surfa		ottom is beige with streaks of blue. One bubbling event	
noticed.				
The Haybale is mostly moist soil with no	flow.			
		****		
- A				
		PERMITTING TO SERVICE AND ADDRESS OF THE PERMITTING THE P	7.000/10	

Wilmington Site

# Interim Action Plan South and West Ditch Precipitate Inspection Report

Date 10/26/2007 Time 10:00 Inspectors Heather Vaillant

Precipi Station Observa			Other Observations		
Station	Yes	No	Other Observations		
Offsite Fenced Ditch System		NO	A == .		
		V	A-Several inches clear water.		
Station A Station B		X	Bottom covered willeaves.		
West Ditch Foot Bridge		_X	B-Clear water, leaves on bottom.		
	-	1005			
Station C		Х	Filled in		
Weir - Upstream		N	High level of clear water.		
Station D		X	Leaves on bottom.		
Weir - Downstream			E+F-Low-moderate flow of		
Station E	X		Clear water.		
Station F	X		G-veg has died back (Scasonal). Some		
Station G	8		Standing water.		
Unnamed Ditch			HOI- no standing water. Soil		
Station H		X	is saturated and welland		
Station I		X	regetation is present.		
Supplemental Inspection					
Locations (designate station					
location on page 2 of 2)					
Staff Gauge Level 0.6					
Condition of Weir / Haybale Barriers:					
Weir- Moderate flo	ow f	rom	outlet pipe. Clear, blue-green		
color water. Tan/	beige	pre	cipitate on nottom. Green		
algae on bottom.		!(			
		100			
Hauhale line - Several	incl	105 (	of standing water water is		
clear and bottom	is c	NIEVE	1 with leaves		
		VIII			



### TRANSMITTAL

To: Ms. W	/inifred	McGowan		_ Date:	December 13, 2007		
Wilm	ington C	Conservation	Commission	Proj. No:	89241.00		
121 0	lenn Ro	ad	(1.0 m) (1.0 m)	Project:	DEP File #334-419		100
Wilm	ington, l	MA 01887		-			
We are send	ing you	ŧē					
			inder Separate Cover		п	7	
Via: ☐ Overnight☐ Messenge	The state of the s		axi Pirect from printer	Regular Mail		33 Waldo Stre Worcester, M Tel: 508-79	A 01608
The followin  Change Copy of L  Digital Mo	rder etter		Prawings hotocopies lans	☐ Prints ☐ Reports ☐ Other:	Samples Specifications	Fax: 508-79.	2-4509
No. of Copi	es Dra	wings No.	Date or Revision	Description			
1			December 5, 2007	November We	ir Reports and Letter		
This inform For Your Unchecke Prelimina Revised F Final Plan	Informat ed ry lans	ion	Approved as submitted Approved as noted Disapproved Returned for corrections Sent for your review & co	☐ Resubm ☐ Return ☑ Submit	it copies for approval corrected prints copies for distribution		
Remarks:	Dear M	s. McGowan	)				
	Attache	ed is the weir	inspection reports for	the Olin facility	for November.		
9	Please o	call me at 61	7-896-4351 with any q	uestions.			
14	Thank	you.	and the same facilities and the same facilities are same facilities.				
cc:	Mr. Joe Mr. Bra	eve Morrow, e Coyne, DEF ain Guichard n DiLorenzo,	From:	Heather Vaillar	es Vaillant	Note: If enclo not as noted, p contact us imm	olease

Mr. Peter Thompson, MACTEC



15 Elkins Street Boston, MA 02127

Tel: 617-896-4300 800-288-8123

Fax: 617-896-4301

www.bscgroup.com

THE STATE OF THE SECOND SECOND

December 5, 2007

Wilmington Conservation Commission Town Hall 121 Glen Road Wilmington, MA 01887 Attn: Winifred McGowan

Re:

Olin Corporation - DEP File #344-419

Weir Inspection Reports BSC Job #89241.00

#### Dear Commission:

This letter is part of the weekly weir inspections carried out at the Olin Property in Wilmington, Massachusetts by BSC Group, Inc. and Olin Corporation. Attached are the weekly weir inspection reports for the month of November 2007. BSC conducted an inspection on Friday, November 30, 2007.

West Ditch Off-Property

Station A had several inches of clear water throughout the moth. The surface of the water and the bottom of the ditch were covered with leaves.

Station B is located along the west ditch at the culvert leading under the railroad tracks to the weir. The water observed at Station B was clear. The channel bottom was covered with leaves.

Station D, located up stream of the weir had several inches water. Due to the high water level, the bottom of the stream could not be observed. The water color was dark throughout most of the month.

Clear water was flowing from the weir outlet pipe during most of the month. There was no water observed flowing from the on property west ditch. The water below the weir was slightly cloudy to clear with a green and beige coloration visible throughout the water column. The channel bottom was covered with a beige-colored precipitate.

Wetland Areas South of the South Ditch

Stations H and I had standing clear water during most of the month of November. The ground was covered with leaves and wetland vegetation was present.

Environmental Scientists

Engineers

South Ditch Downstream of the Weir

Station E and Station F, located along the south ditch, had a moderate to high volume of clear water flowing through the channel. The channel bottom was a rust color and covered in leaves. Landscape Station G, the delta area, had standing clear water. The vegetation that was previously covering Architects this area has died back for the season.

**GIS Consultants** 

Planners

Surveyors

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THE PROPERTY OF THE PROPERTY O



A moderate volume of clear water was flowing through the center of the haybale line, located downstream of the delta area, during most of the month.

#### Wildlife

A variety of songs birds were observed throughout the site.

Vaillant

If you have any questions or need additional information please contact me at 617-896-4351.

Sincerely,

BSC Group, Inc.

Heather Vaillant

Environmental Planner

Enclosures:

11/02/2007 Inspection Report

11/09/2007 Inspection Report

11/16/2007 Inspection Report

11/21/2007 Inspection Report

11/30/2007 Inspection Report

cc:

Mr. Steve Morrow, Olin Corp.

Mr. Joe Coyne, DEP (Electronically)

Mr. Brian Guichard, Olin Corp.

Mr. Peter Thompson, MACTEC

Mr. Jim DiLorenzo, EPA

### Wilmington Site

Date	11/2/2007	Time	13:00 Inspectors	s Leroy Johnson	
_					

Y	es	/ation	Other Observations
Offsite Fenced Ditch System		No	
			Station A has about 3 inches of clear water. The
Station A		x	surface is covered w/leaves and pine needles. Station
Station B		х	B has clear water on top with leaves on the bottom.
West Ditch Foot Bridge	17		
Station C		X	Filled in
Weir - Upstream			Clear water on top with leaves and rocks on the
Station D		x	bottom.
Weir - Downstream			Stations E and F have almost no flow with fallen
Station E	х		leaves on the water surface. The bottom is brown in
Station F	x		color. Station G is mostly visible but has no flow at
Station G		x	this time.
Unnamed Ditch		15.	Stations H and I water saturated soil with leaves on
Station H		х	top.
Station I		х	
Supplemental Inspection Locations (designate station location on page 2 of 2)			
Staff Gauge Level			
Condition of Weir / Haybale Barriers:			There is no flow from the outlet pipe. The main area is
cloudy with some scum on the water surface	ce. The	e bottom i	is beige and blue.
The Haybale line has a trickle of clear wate			7074 - 1075 - 10

## Wilmington Site

Date	11/9/2007	Time	9:15 Inspectors	Leroy Johnson	
The same of the sa		_			

Station	Precipitate Observation		Other Observations	
	Yes No			
Offsite Fenced Ditch System			Station A has about 5 inches of clear water. The	
Station A		х	surface is covered with leaves. Station B has clear	
Station B		х	water on top with leaves on the top and bottom.	
West Ditch Foot Bridge				
Station C		X	Filled in	
Weir - Upstream	5818		Water in the area is dark amber colored and hard to	
Station D		х	see through. Stirred up from heavy rain flow.	
Weir - Downstream	1		Stations E and F have a medium flow of clear water,	
Station E	х		the bottom is brown in color. The area around station	
Station F	х		G is flooded and has a medium flow of clear water.	
Station G		х		
Unnamed Ditch			Station H has some free standing water. Station I	
Station H		х	has no free standing water but is very saturated.	
Station I		x		
Supplemental Inspection Locations (designate station location on page 2 of 2)	,			
Staff Gauge Level				
Condition of Weir / Haybale Barriers:			There is a medium flow of clear water from the outlet	
pipe. The main area is slightly cloudy a	nd has a	beige cold	ored bottom with a few small areas of blue.	
The Haybale line has a medium flow of	clear wa	ter.	A 6.	
			The second secon	
	-			
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	7.10	15	, , , , , , , , , , , , , , , , , , , ,	
* *************************************				

### Olin Corporation

### Wilmington Site

# Interim Action Plan South and West Ditch Precipitate Inspection Report

Date	11/16/2007	Time	9:00 Inspectors	<b>Brian Guichard</b>	
o. 14	The second second				x 2 11 100000

Station		Precipitate Observation		Other Observations
11 2 1		Yes	No	
Offsite Fenc	ed Ditch System			Station A has about 5" of clear water with newly
1	Station A		x	fallen leaves on the surface and bottom. Station B has
100	Station B	9	х	clear water on top with leaves on the bottom.
West Ditch F	oot Bridge		1.0	
of 1	Station C		X	Filled in
Weir - Upstro	eam			Water in the area is dark and hard to see through due
	Station D	37,	X	to ongoing and prior heavy rains.
Weir - Down	stream			Stations E and F have a heavy flow of clear water. The
	Station E	X		bottom and water surface are mostly covered with
	Station F	х		newly fallen leaves. The areas of the channel bottom
	Station G		х	that can be seen are rust colored.
Unnamed Di	tch			Stations H and I are both flooded.
	Station H	, , , , , , , , , , , , , , , , , , , ,	x	
	Station I		x	
The state of the s	al Inspection designate station page 2 of 2)			
Staff Gauge				
Condition of We	eir / Haybale Barriers:			There is no flow from the on property west ditch, however
there is a large	flow of clear water from	the weir	area. The	main area is clear and has newly fallen leaves on the
water surface a	nd bottom. The rest of t	he area t	oottom is b	prown in color. The main channel water level is high and
has a heavy flo	w of clear water. Station	G (the D	elta area)	is completely flooded and all vegetation in the area
has died back f	or the winter.		l.	
	e has a heavy flow of cl	ear water	flowing th	nrough the center.
The navbale lin				· · · · · · · · · · · · · · · · · · ·

### **Olin Corporation**

### Wilmington Site

# Interim Action Plan South and West Ditch Precipitate Inspection Report

Date	11/21/2007	Time	10:00 Inspectors	Brian Guichard	

Station	Precipitate Observation		Other Observations	
, d	Yes	No		
Offsite Fenced Ditch System		T	Station A has 5-6" of clear water, most of the leaves	
Station A		x	have settled to the bottom. Station B has clear	
Station B		x	water on top with leaves on the bottom.	
West Ditch Foot Bridge	20.			
Station C		х	Filled in	
Weir - Upstream			Water surface is clear of leaves, bottom still hard to	
Station D		x	see because of dark amber colored water.	
Weir - Downstream			Stations E and F have a medium flow of lightly cloudy	
Station E	х		water. Water level in the channel is slightly high and	
Station F	х		most of the leaves have settled to the bottom. Station	
Station G	-	х	G is flooded with clear water.	
Unnamed Ditch			Station H is flooded with clear water. Station I has a	
Station H		x	little free standing water, the rest of the area is just	
Station I		x	water saturated soil.	
Supplemental Inspection Locations (designate station location on page 2 of 2)				
Staff Gauge Level			- 1	
Condition of Weir / Haybale Barriers:			There is a low flow of clear water from both the outlet	
pipe and the weir area. The main area	is slightly	cloudy wit	h a mix of beige and blue colored precipitate on the	
bottom. There is some mild foaming just				
There is a medium flow of clear water g				
			2	
			PORTON TO THE PROPERTY OF THE	
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### **Olin Corporation**

Wilmington Site

## Interim Action Plan South and West Ditch Precipitate Inspection Report

Date 11/30/2007 Time 8:15 am Inspectors Heather Vaillant

	Droci	pitate					
Station Observat		•	Other Observations				
	Yes	No					
Offsite Fenced Ditch System			A-several inches of clear Standing				
Station A		X	water. Bottom covered w/ leaves.				
Station B		X	B-standing clear water, surface is partially frozen; leaves on bottom				
West Ditch Foot Bridge			partially frozen; leaves on bottom				
Station C		x	Filled in				
Weir - Upstream			High level of Standing water.				
Station D			Unable to observe hottom.				
Weir - Downstream			EXF-moderate to high flow of clear				
Station E	$\times$		water rust-colored bottom				
Station F	X		G - ~2" of standing clear				
Station G		X	water				
Unnamed Ditch			H-~1" of standing water, ground				
Station H		X	corpred w/ leaves				
Station I		X	I - Some ponding of water; leaves				
Supplemental Inspection							
Locations (designate station location on page 2 of 2)	ļ						
Staff Gauge Level	0.	9					
Condition of Weir / Haybale Barriers:							
_	low i	FCIP	ar water from outlet pipe.				
			nd blue-green in color.				
Jan precipitate.	COLACA	9 12	The grant of the				
TICH Precipitate.							
Haubale Ine - 1	NM 7-	100 IV	lorate Phy of clear water				
instance is brough	Haybale line - low to moderate flow of clear water, bottom is brown and covered with leaves						
100000000000000000000000000000000000000	M (C)	COVEL					

### **APPENDIX D**

Annual Status Report for Plant B Area Remediation Systems (Shaw)



Date: <u>December 20, 2007</u>

Project No.: <u>681076.02000000</u>

Phone: (617) 589-8000/Fax: (617) 589-2160

#### TRANSMITTAL LETTER:

To:	Mr.	Steve Morrow	r				
Addr	ess: Olir	Corporation					
	1186	Lower River	Road				
	P.O.	Box 248					
	Char	leston, Tennes	ssee 37310				
Re:	Ann	ual Status Rep	ort for Plant E	Area Remediation	Systems		
	Olin	Chemical Sup	perfund Site in	Wilmington, MA			
For:	Review	As Req	uested	_Approval _x	Corrections	Submittal	Other
Iten	n No:	No. of Copies	Date:		Docun	nent Title	
	1	1	Dec 2007	Annual Status	Report for Plant	B Area Remedia	ation Systems
Ct		:- C1:	CC4 D.	Discoulations	1		
Steve	- Here	is final version	n of Status Rej	port. Please let me	know if you have	e any comments of	r questions.
CC.	M. Mar	mby MACTE	ec.		Sincerely:	David P. Co Project Mar	,00
	Shaw F	phy - MACTE					

#### ANNUAL STATUS REPORT FOR PLANT B AREA REMEDIATION SYSTEMS

Olin Chemical Superfund Site Wilmington, MA

#### **Prepared For:**

Olin Corporation 1186 Lower River Road, NW Charleston, TN 37310

**Prepared By:** 

**Shaw Environmental, Inc.** 100 Technology Center Drive Stoughton, MA 02072

December 2007

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Graphs	s <b>G</b> 9	E/VPH Soil Vapor Concentrations in Vapor Probes vs. Time (on only)	CD

Graph G10	NAPL Area Soil Vapor Concentrations and Groundwater vs. Time
Graph G11	Influent and Effluent Contaminant Concentrations vs. Time
Graph G12	Cumulative Contaminant Mass Removal vs. Time
Attachment A Attachment B	Laboratory Analytical Results for Air Samples CD with Complete Tables

#### 1.0 INTRODUCTION

The following report summarizes activities related to the operation and maintenance of the remedial systems located in E/VPH and LNAPL areas surrounding Plant B at the former Olin facility (Site) located at 51 Eames Street in Wilmington, MA. This report was prepared by Shaw Environmental, Inc. (Shaw) for the Olin Corporation (Olin). This is the first annual report for Shaw's work at the site. Previous reports were provided on a semi annual basis to Olin in accordance with the Massachusetts Contingency Plan (MCP; 310 CMR 40.0424) which until April 2006 had jurisdiction over the Site. The Site is now under the jurisdiction of the United States Environmental Protection Agency (USEPA) under Identification Number MAD001403104. Previous IRA activities performed under the MCP consisted of the implementation of an *in-situ* remediation system (air sparge, soil vapor extraction, and biostimulation) for the Plant B facility at the 51 Eames Street in Wilmington, Massachusetts. The IRA Plan was approved by MADEP in a letter dated August 4, 2000 and the revision approved on November 2, 2000. The activities performed during the current reporting period are consistent with those presented in previous documents required under the MCP. This status report covers the period between December 7, 2005 and October 11, 2007.

#### 2.0 BACKGROUND

Originally, two separate areas were being addressed with *in-situ* remediation technologies. The EPH/VPH Impacted Groundwater Area (E/VPH Area) is in the vicinity of monitoring well GW-16 located southwest of the Plant B building. The LNAPL Impacted Groundwater Area (NAPL Area) consists of the area east of Plant B where the existing groundwater recovery wells and treatment system is in operation. See Figure 1 for approximate areas.

#### 2.1 E/VPH Area

AS/SVE was selected by Olin as the most feasible technology to enhance the rate of recovery of volatile organic compounds (VOCs) in soil and groundwater in the vicinity of Plant B. The area around monitoring well GW-16 was previously identified as a location of elevated VOCs in groundwater, particularly tri methyl pentenes (Law 2000, HLA 2000, GEI 2000).

A series of AS and SVE points was installed in October 2000 in the area around monitoring well GW-16. The original limits of the remediation area were expanded after elevated headspace readings were detected in samples collected during boring installation activities south, southwest and west of GW-16. Due to total VOC concentrations in headspace samples from soils collected from Boring B-10, test pits located in the vicinity of the former building slab were performed on November 1, 2000 to further delineate the nature and extent of the impacted area. A modification to the IRA was submitted to the MADEP in a letter from GEI Consultants Inc. (GEI) dated October 31, 2000 (Modification #2 of Plant B IRA Plan). MADEP approved the modification verbally on November 1, 2000 and in writing in a letter to Olin dated November 2, 2000.

Additional borings were conducted and SVE wells installed from November 14 through 16, 2000 to delineate the extent of impact around the perimeter of the slab and allow for treatment of the soil. Elevated headspace readings were encountered during the advancement of borings and test pits in the slab area. Laboratory analyses of samples collected from the area during test pitting activities indicated 2,4,4-trimethyl-1-pentene, 2,4,4-trimethyl-2-pentene, and Bis-2-ethylhexyl phthalate (BEHP) as the primary compounds detected in the soils and groundwater. Maximum concentrations detected in the soil were 6,400,000 microgram per kilogram ( $\mu$ g/kg) of 2,4,4-trimethyl-1-pentene, 3,700,000  $\mu$ g/kg of 2,4,4-trimethyl-2-pentene, and 580,000  $\mu$ g/kg of BEHP. Maximum groundwater concentrations detected in the samples were 67,000 micrograms per liter ( $\mu$ g/l) of 2,4,4-trimethyl-1-pentene, 120,000  $\mu$ g/l of 2,4,4-trimethyl-2-pentene and 7,500  $\mu$ g/l of BEHP.

Air sparge wells were installed in borings advanced to approximately 8 to 10 feet below the water table (approximately 18 to 20 feet below ground surface (BGS)). Additional information regarding the well installation activities, boring logs, and soil sampling activities was presented in the January 2001 IRA Status Report for Plant B. Figure 1 shows the former locations of the SVE and AS wells installed at the Site and subsequently abandoned in October 2005. Olin had received MADEP approval to decommission the E/VPH portion of the system prior to system shutdown.

#### 2.2 NAPL Area

Five AS and multi-phase extraction (MPE) well clusters (AS/MPE-21 through AS/MPE-25; see Figure 1) were installed along the back (northeastern) side of Plant B, adjacent to the building and upgradient from the wells and groundwater extraction wells. The primary contaminants of concern are BEHP, N-nitrosodiphynlamine (NDPA), and other semi-volatile organic compounds (SVOCs). Groundwater is located approximately 10 to 12 feet BGS and LNAPL has been detected on the groundwater table in several wells in the LNAPL Area. Additional information regarding the installation of the AS and MPE wells (boring logs, well construction details, etc.) was provided in a previously submitted IRA Status Report dated January 2001. The LNAPL Area is presented on Figure 1.

#### 2.3 Treatment System Installation

The treatment system trailer houses the components of the AS and SVE system. The treatment system was installed in October and November 2000. Upon installation, the AS system manifold was split into two sections each with a manual timer to control the injection of air into the E/VPH and LNAPL Areas. The installed SVE system consists of two 2 horsepower regenerative blowers and one 60 gallon air/water separator equipped with a 10 gallon per minute liquid transfer pump. The SVE system was connected to vapor extraction wells in both the LNAPL and E/VPH areas and is in continuous operation at the site. The E/VPH portion of the AS/SVE system was decommissioned in October 2005. Extracted air is currently routed through an off-gas treatment unit consisting of two 2,000 pound vapor phase carbon vessels in series.

An as-built drawing of the existing pipe network as of the close of this reporting period is shown in Figure 1.

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#### 2.4 Laboratory Treatability Study Results

Envirogen conducted a Laboratory Treatability Study (LTS) in May 2001 on the soil samples collected during the October 2000 drilling event from the NAPL Area. The results from the LTS indicated that soils at the groundwater/LNAPL interface in the LNAPL Area do have an active microbial population capable of degrading both BEHP and NDPA. Degradation of the NDPA was found to be more dependent upon the aeration of the test sediments than the addition of nutrients with the majority of the NDPA degradation occurring within the first month of the study. BEHP levels were found to decline more appreciably in the nutrient-amended samples. The fact that biodegradation occurred in nutrient-amended, but not in unamended samples, suggests that the microbial population degrading BEHP is limited in either nitrogen or phosphorous in the Site soils. The results of the LTS are summarized in Envirogen's report "Pilot Test Summary Report for Plant B Area Remediation Systems", dated August 2001. The report was submitted to the MADEP as part of the August 2002 IRA Status Report.

#### 3.0 SUMMARY OF REMEDIAL ACTIVITIES FOR REPORTING PERIOD

The following sections of the report summarize relevant information related to the operation of the AS/SVE system as part of the remedial action at the Site. The format is in accordance with categories presented in the MCP (310 CMR 40.0425).

#### 3.1 Operation and Maintenance

#### 3.1.1 AS/MPE System Operation and Maintenance

The installed AS/MPE system (LNAPL Area) remained operational in the LNAPL Area during the reporting period. Periodic short duration shutdowns of the AS/SVE system were noted throughout the reporting period for routine causes (power loss, maintenance, etc.).

The AS/SVE system continues to remove residual VOCs in vadose zone soils and groundwater. Approximately 9.5 pounds of VOCs have been removed during this reporting period for a cumulative system total of approximately 2,230 pounds. Based on analytical results collected from air samples from the influent to the AS/SVE system, the removed contaminants remained primarily 2,4,4-trimethyl-1-pentene and 2,4,4-trimethyl-2-pentene. Although it continues to remove contaminant mass, the AS/SVE effectiveness is limited due to the amount of recoverable contaminant remaining in the treatment zone.

Shaw and Olin Site personnel continued performing weekly O&M activities during the reporting period. Information collected during Site visits consisted of periodic groundwater level readings, weekly soil vapor sample collection for field organic vapor meter (OVM) screening from wellheads in the LNAPL and the SVE system influent and effluent, and routine system maintenance. In accordance with previous MADEP requirements, air samples from the SVE system influent and effluent (two total) were collected on a monthly basis and submitted to a laboratory for VOC analysis using EPA method TO-14 (influent) and MADEP method Air Phase Petroleum Hydrocarbon (APH) on the effluent. Information collected during the Site

Page 4

visits was done in accordance with the O&M schedule submitted in previous IRA status reports. A discussion of the field data is presented in Section 4.0 below.

#### **System Operation Modifications**

No significant modifications were made to the installed system during this reporting period.

#### 3.1.2 Nutrient Injection System (NIS)

Nutrient injections were performed on a weekly basis in the NAPL area between December 7, 2005 and January 17, 2006. The injections were suspended for the remainder of the reporting period due to elevated orthophosphate-P and ammonia-N concentrations in groundwater samples from the Plant B influent the sample analyses were performed by Olin site personnel using field screening kits. Nutrient addition events during this reporting period occurred on December 13, December 21, and December 27, 2005 and January 3, January 10, and January 17, 2006. Approximately 3,900 liters of nutrient were added during this reporting period.

Table J-1 presents a summary of nutrient addition event information. Table J-2 presents pre- and post-injection groundwater elevation monitoring information for wells within the LNAPL area. Table I-2 summarizes results of the field kit analyses of the groundwater samples. No groundwater samples were collected by Shaw for laboratory analysis during this reporting period.

#### **System Operation Modifications**

No significant modifications were made to the installed system during this reporting period.

#### 4.0 PERFORMANCE MONITORING

#### 4.1 Groundwater monitoring

Tables summarizing groundwater measurements (Tables A1 through A25) and soil gas field screening readings (Tables B1 through B20 and C1 through C5) for this reporting period have been attached. No measurable NAPL layers were detected in the monitored wells during this reporting period. The previous detected maximum LNAPL thickness was 0.47 feet in well P-5 in July 2005.

The estimated total mass of VOCs removed during this reporting period is 9.5 pounds. A summary of estimated VOC contaminants removed by the SVE system during this reporting period has been included as Table H1.

Groundwater monitoring was performed in both the E/VPH and NAPL Areas during the reporting period in accordance with the monitoring program previously submitted. Groundwater monitoring consisted of the periodic collection of depth to groundwater and product thickness measurements in wells in the NAPL Area on a weekly, biweekly and periodic basis. Groundwater elevations in wells GW100, GW101, and GW102, located

along the northeastern boundary of the property and hydraulically downgradient of Plant B, were monitored on a weekly basis to verify there was no migration of NAPL off-Site into adjacent properties. Wells in which groundwater and product thickness are monitored in the E/VPH Area include GW-16 (weekly), B17 (periodically), and B7A (periodically). Tables summarizing the groundwater monitoring data are included as Tables A1 through A25.

No significant increases in NAPL thickness in the sentinel wells downgradient of the LNAPL area (GW-100, GW-101 and GW-102) or abnormal fluctuations in groundwater elevations in the NAPL area were observed during this period.

#### 4.2 Soil Gas Monitoring

Total VOC readings measured in the LNAPL Area during this reporting period remained consistent with those observed in the previous reporting period. The maximum total VOC concentration (as measured with the OVM) in the NAPL Area recorded during this reporting period was 14.4 ppmv at MPE 21 on October 11, 2007. Tables C1 through C5 summarize the field screening results for soil gas samples collected from the LNAPL Area. Graph G10 presents the soil gas and groundwater data collected during the reporting period on one graph for individual MPE wells.

Tables B1 through B20 summarize the historical field screening results for soil gas samples collected from the E/VPH Area. Graphs G1 through G8 present the historical soil gas and groundwater data collected for individual SVE wells. Graph G9 presents historical soil gas and groundwater data collected from the former vapor probes installed in the E/VPH Area. These tables and graphs are included only on the compact disc provided in Attachment B since there will be no additional updates to these items as a result of the decommissioning of the SVE wells and vapor probes in the E/VPH area on October 2005.

#### 4.3 Influent/Effluent Air Sampling Results

Air samples were collected from the influent SVE air stream from the NAPL Area and the effluent of the secondary vapor phase carbon unit. The samples were collected on a monthly basis during the reporting period and submitted to Alpha Analytical for analysis. The influent air sample was analyzed for VOCs using EPA Method TO-14 with the target compound list modified to include 2,4,4-trimethyl-1-pentene and 2,4,4-trimethyl-2-pentene. The effluent air sample was submitted for analysis by MADEP's Air Phase Petroleum Hydrocarbon (APH) method. Samples were collected using 6 liter SUMMA canisters. Air samples were collected in 2006 on January 6, February 17, March 17, April 10,.May 26, July 21, August 18, September 15, October 20, and December 1. Air samples were collected in 2007 on January 10, February 28, March 23, April 19,.May 17, June 26, July 25, August 24, and September 26.

Laboratory results received for the influent air samples collected during this reporting period indicated stable concentrations of 2,4,4-trimethyl-1-pentene and 2,4,4-trimethyl-2-

Page 6

pentene from the LNAPL area during the sampling events with minor fluctuations occurring between July and September 2007.

Table F1 summarizes the laboratory results received for the analyzed air samples. Copies of the laboratory data received for the air samples are included as Attachment A. Graph G11 presents total influent VOC concentrations entering the treatment system from the treatment areas versus time.

#### 4.4 Visual Inspection

In addition to the above referenced monitoring activities, Shaw and Olin personnel also visually inspected the drainage ditch located along the northeastern property boundary of the Plant B area on a weekly basis for the presence of free product. Free product was not observed on the standing water in the drainage ditch during the reporting period.

#### 5.0 MANAGEMENT OF REMEDIATION WASTE

No remedial waste requiring off-site disposal was generated by the SVE treatment system during the operating period.

#### 6.0 SUMMARY AND CONCLUSIONS

It is Shaw's opinion that the AS/SVE system in the LNAPL Area around Plant B is currently being operated in accordance with the conditional approval letters issued by MADEP to Olin dated August 4, 2000 and October 31, 2000 and in accordance with the procedures and schedule presented in the Pilot Test Report (PTR) previously submitted to MADEP (August 2001).

Based on the operational data recorded during the reporting period, the following conclusions and recommendations are noted:

- The effectiveness of the AS/SVE system continues to diminish over time as expected with this type of remedial system. With the significant decrease in influent contaminant concentrations to the SVE system since start up and the lack of detection of any residual product in the monitoring wells within and around the treatment zone, there appears to be a minimal amount of residual contaminant mass in the treatment zone. To more accurately assess the presence of contaminant mass in the treatment zone, additional groundwater sampling and rebound tests should be performed. A rebound test consisting of temporarily shutting down the AS/SVE system and nearby extraction wells would be beneficial in evaluating the residual LNAPL in the vadose zone and the soil/groundwater interface.
- The NIS system should remain shut down until ammonia-N concentrations in monitored wells decrease to pre injection conditions. It is believed that the addition of nutrients has benefited, and would continue to stimulate, the progress of in-situ biodegradation. However, further biodegradation in areas of the treatment zone may be limited due to high ammonia and phosphate levels.

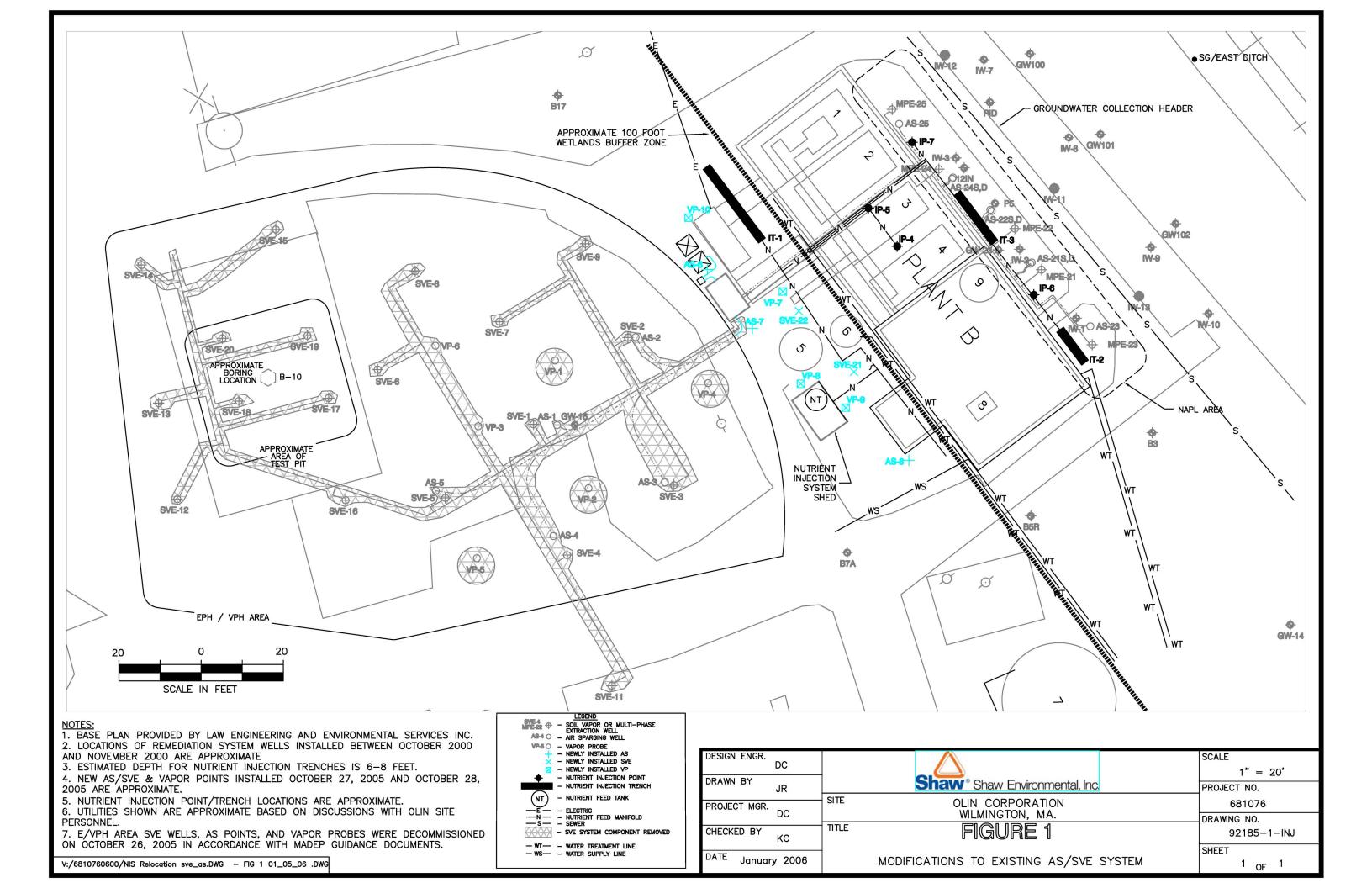


Table A-1

#### **Groundwater Monitoring Data for Well 12-IN**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
02/19/04	12.38	12.38	Trace	77.46	77.46
04/29/04	11.03	11.03	Trace	78.81	78.81
05/27/04	11.96	ND	0	77.88	77.88
09/24/04	12.17	ND	0	77.67	77.67
11/04/04	12.50	ND	Trace	77.34	77.34
12/03/04	12.66	12.65	0.01	77.18	77.19
01/13/05	12.48	ND	Trace	77.36	77.36
02/23/05	12.02	12.01	0.01	77.82	77.82
03/31/05	11.20	ND	0	78.64	78.64
04/21/05	11.81	ND	0	78.03	78.03
05/20/05	11.95	ND	0	77.89	77.89
06/14/05	11.56	ND	0	78.28	78.28
07/27/05	12.21	ND	0	77.63	77.63
12/02/05	11.78	ND	Trace	78.06	78.06
01/06/06	11.46	ND	0	78.38	78.38
02/17/06	11.63	ND	0	78.21	78.21
03/17/06	12.12	ND	0	77.72	77.72
04/10/06	12.39	ND	0	77.45	77.45
05/26/06	10.65	ND	0	79.19	79.19
07/07/06	11.15	ND	0	78.69	78.69
07/18/06	11.00	ND	0	78.84	78.84
08/18/06	11.94	ND	0	77.90	77.90
09/14/03	12.10	ND	Trace	77.74	77.74
10/20/06	12.22	ND	Trace	77.62	77.62
11/16/06	11.56	ND	0	78.28	78.28
12/01/06	11.58	ND	0	78.26	78.26
01/10/07	11.88	ND	0	77.96	77.96
02/28/07	12.26	Trace	0	77.58	77.58
03/23/07	11.86	ND	0	77.98	77.98
04/19/07	10.64	ND	0	79.20	79.20
05/17/07	11.40	Trace	0	78.44	78.44
06/26/07	11.79	Trace	0	78.05	78.05
07/25/07	12.22	ND	0	77.62	77.62
08/24/07	12.42	ND	0	77.42	77.42
09/01/07	12.24	Trace	0	77.60	77.60

- 1) Reference Elevation for 12-IN is 89.84.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Table A-2

#### **Groundwater Monitoring Data for Well B-2**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
02/19/04	12.69	ND	0	77.79	77.79
03/31/04	12.87	ND	0	77.61	77.61
04/29/04	11.99	ND	0	78.49	78.49
05/27/04	12.48	ND	0	78.00	78.00
07/14/04	12.76	ND	0	77.72	77.72
09/24/04	12.52	ND	0	77.96	77.96
11/04/04	12.77	ND	0	77.71	77.71
12/03/04	12.68	12.67	0.01	77.80	77.81
01/13/05	12.57	ND	0	77.91	77.91
02/23/05	12.25	ND	0	78.23	78.23
03/31/05	11.66	ND	0	78.82	78.82
04/21/05	12.13	ND	0	78.35	78.35
05/20/05	12.23	ND	0	78.25	78.25
06/14/05	12.14	ND	0.00	78.34	78.34
07/27/05	12.66	ND	0.00	77.82	77.82
08/25/05	13.02	ND	Trace	77.46	77.46
09/29/05	13.18	ND	0	77.30	77.30
12/02/05	12.02	ND	0	78.46	78.46
01/06/06	12.01	ND	0	78.47	78.47
02/17/06	11.91	ND	0	78.57	78.57
03/17/06	12.28	ND	0	78.20	78.20
04/10/06	12.53	ND	0	77.95	77.95
05/26/06	11.21	ND	0	79.27	79.27
07/07/06	11.76	ND	0	78.72	78.72
07/18/06	11.61	ND	0	78.87	78.87
08/18/06	12.25	ND	0	78.23	78.23
09/14/06	12.32	ND	0	78.16	78.16
10/20/06	12.52	ND	0	77.96	77.96
11/16/06	12.00	ND	0	78.48	78.48
12/01/06	12.04	ND	0	78.44	78.44
01/10/07	12.26	ND	0	78.22	78.22
02/28/07	12.53	ND	0	77.95	77.95
03/23/07	12.27	ND	0	78.21	78.21
04/19/07	11.18	ND	0	79.30	79.30
05/17/07	11.93	ND	0	78.55	78.55
06/26/07	12.27	ND	0	78.21	78.21
07/25/07	12.66	ND	0	77.82	77.82
08/24/07	12.74	ND	0	77.74	77.74
09/21/07	12.63	ND	0	77.85	77.85

- 1) Reference Elevation for B-2 is 90.48.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness  $\times$  0.95)

Table A-3

#### **Groundwater Monitoring Data for Well B-3**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
02/19/04	12.60	ND	0	77.72	77.72
04/29/04	11.40	ND	0	78.92	78.92
05/27/04	12.27	ND	0	78.05	78.05
07/14/04	12.69	ND	0	77.63	77.63
09/24/04	12.40	ND	0	77.92	77.92
11/04/04	12.78	ND	0	77.54	77.54
12/03/04	12.78	ND	0	77.54	77.54
01/13/05	12.61	ND	0	77.71	77.71
02/23/05	12.03	ND	0	78.29	78.29
03/31/05	11.34	ND	0	78.98	78.98
04/21/05	11.87	ND	0	78.45	78.45
05/20/05	12.05	ND	0	78.27	78.27
06/14/05	11.85	ND	0	78.47	78.47
07/27/05	12.52	ND	0	77.80	77.80
08/25/05	13.11	ND	Trace	77.21	77.21
09/29/05	13.31	ND	0	77.01	77.01
12/02/05	11.84	ND	0	78.48	78.48
01/06/06	11.70	ND	0	78.62	78.62
02/17/06	11.58	ND	0	78.74	78.74
03/17/06	12.03	ND	0	78.29	78.29
04/10/06	12.48	ND	0	77.84	77.84
05/26/06	10.49	ND	0	79.83	79.83
07/07/06	11.20	ND	0	79.12	79.12
07/18/06	11.02	ND	0	79.30	79.30
08/18/06	11.99	ND	0	78.33	78.33
09/14/06	12.26	ND	0	78.06	78.06
10/20/06	12.46	ND	0	77.86	77.86
11/16/06	10.49	ND	0	79.83	79.83
12/01/06	11.75	ND	0	78.57	78.57
01/10/07	11.95	ND	0	78.37	78.37
02/28/07	12.36	ND	0	77.96	77.96
03/23/07	12.07	ND	0	78.25	78.25
04/19/07	10.58	ND	0	79.74	79.74
05/17/07	11.41	ND	0	78.91	78.91
06/26/07	11.88	ND	0	78.44	78.44
07/25/07	12.52	ND	0	77.80	77.80
08/24/07	12.68	ND	0	77.64	77.64
09/21/07	12.41	ND	0	77.91	77.91

- 1) Reference Elevation for B-3 is 90.32.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

#### **TABLE A-4**

#### **Groundwater Monitoring Data for Well B5-R**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
11/15/05	12.40	ND	0	78.98	78.98
11/15/05	12.40	ND	0	78.98	78.98
11/22/05	12.05	ND	0	79.33	79.33
11/22/05	12.04	ND	0	79.34	79.34
11/29/05	12.02	ND	0	79.36	79.36
11/29/05	12.02	ND	0	79.36	79.36
12/02/05	11.79	ND	0	79.59	79.59
12/06/05	11.90	ND	0	79.48	79.48
12/06/05	11.91	ND	0	79.47	79.47
12/13/05	12.26	12.26	0	79.12	79.12
12/13/05	12.27	12.27	0	79.11	79.11
12/21/05	12.08	ND	0	79.30	79.30
12/21/05	12.08	ND	0	79.30	79.30
12/27/05	11.87	ND	0	79.51	79.51
12/27/05	11.87	ND	0	79.51	79.51
01/03/06	11.64	ND	0	79.74	79.74
01/03/06	11.64	ND	0	79.74	79.74
01/06/06	11.71	ND	0	79.67	79.67
01/10/06	12.02	ND	0	79.36	79.36
01/10/06	12.01	ND	0	79.37	79.37
01/17/06	11.65	ND	0	79.73	79.73
01/17/06	11.64	ND	0	79.74	79.74
02/17/06	11.49	ND	0	79.89	79.89
03/17/06	12.41	ND	0	78.97	78.97
04/10/06	12.81	ND	0	78.57	78.57
05/26/06	9.99	ND	0	81.39	81.39
07/07/06	10.85	ND	0	80.53	80.53
07/18/06	10.72	ND	0	80.66	80.66
08/18/06	12.09	ND	0	79.29	79.29
09/14/06	12.53	ND	0	78.85	78.85
10/20/06	12.80	ND	0	78.58	78.58
11/16/06	11.67	ND	0	79.71	79.71
12/01/06	11.59	ND	0	79.79	79.79
01/10/07	11.95	ND	0	79.43	79.43
02/28/07	12.85	ND	0	78.53	78.53
03/23/07	12.26	ND	0	79.12	79.12
04/19/07	10.04	ND	0	81.34	81.34
05/17/07	11.05	ND	0	80.33	80.33
06/26/07	12.05	ND	0	79.33	79.33
07/25/07	12.89	ND	0	78.49	78.49
08/24/07	13.18	ND	0	78.20	78.20
09/21/07	13.10	ND	0	78.28	78.28

- 1) Reference Elevation for B5-R is 91.38.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Table A-5

Groundwater Monitoring Data for Well B-7A
Olin Chemical Corporation - Wilmington, MA

_	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
07/27/05	9.14	ND	0	79.67	79.67
08/10/05	9.67	ND	0	79.14	79.14
08/25/05	10.11	ND	0	78.70	78.70
09/12/05	10.43	ND	0	78.38	78.38
09/29/05	10.68	ND	0	78.13	78.13
11/11/05	8.45	ND	0	80.36	80.36
12/02/05	8.01	ND	0	80.80	80.80
12/23/05	8.43	ND	0	80.38	80.38
01/06/06	7.90	ND	0	80.91	80.91
01/19/06	7.57	ND	0	81.24	81.24
02/17/06	7.64	ND	0	81.17	81.17
02/28/06	8.11	ND	0	80.70	80.70
03/17/06	8.78	ND	0	80.03	80.03
03/28/06	9.08	ND	0	79.73	79.73
04/10/06	9.25	ND	0	79.56	79.56
04/28/06	9.34	ND	0	79.47	79.47
05/11/06	8.82	ND	0	79.99	79.99
05/26/06	5.90	ND	0	82.91	82.91
06/05/06	6.15	ND	0	82.66	82.66
06/19/06	5.51	ND	0	83.30	83.30
07/07/06	6.80	ND	0	82.01	82.01
07/18/06	6.78	ND	0	82.03	82.03
08/18/06	8.34	ND	0	80.47	80.47
09/01/06	8.66	ND	0	80.15	80.15
09/14/06	8.96	ND	0	79.85	79.85
10/06/06	9.32	ND	0	79.49	79.49
10/20/06	9.33	ND	0	79.48	79.48
11/03/06	8.81	ND	0	80.00	80.00
11/16/06	7.99	ND	0	80.82	80.82
12/01/06	7.79	ND	0	81.02	81.02
12/11/06	8.21	ND	0	80.60	80.60
12/29/06	8.74	ND	0	80.07	80.07
01/10/07	8.46	ND	0	80.35	80.35
01/23/07	8.56	ND	0	80.25	80.25
02/05/07	9.03	ND	0	79.78	79.78
02/28/07	9.49	ND	0	79.32	79.32
03/07/07	8.76	ND	0	80.05	80.05
03/23/07	8.71	ND	0	80.10	80.10
04/05/07	8.26	ND	0	80.55	80.55
04/19/07	6.11	ND	0	82.70	82.70
05/03/07	7.03	ND	0	81.78	81.78
05/17/07	7.39	ND	0	81.42	81.42
06/15/07	7.81	ND	0	81.00	81.00
06/26/07	8.34	ND	0	80.47	80.47
07/10/07	7.86	ND	0	80.95	80.95

Table A-5

### **Groundwater Monitoring Data for Well B-7A**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
07/25/07	9.39	ND	0	79.42	79.42
08/10/07	9.52	ND	0	79.29	79.29
08/24/07	9.79	ND	0	79.02	79.02
09/04/07	10.02	ND	0	78.79	78.79
09/21/07	9.83	ND	0	78.98	78.98
10/23/07	10.15	ND	0	78.66	78.66

- 1) Reference Elevation for B-7A is 88.81.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Table A-6

Groundwater Monitoring Data for Well B-17
Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
03/10/05	9.28	ND	Trace	82.27	82.27
03/31/05	7.60	ND	0.00	83.95	83.95
04/09/05	7.77	ND	0.00	83.78	83.78
04/21/05	8.74	ND	0.00	82.81	82.81
05/20/05	9.16	ND	0.00	82.39	82.39
06/03/05	8.02	ND	0.00	83.53	83.53
06/14/05	8.76	ND	0.00	82.79	82.79
07/13/05	9.68	ND	0.00	81.87	81.87
07/27/05	10.70	ND	0.00	80.85	80.85
08/10/05	11.36	ND	0.00	80.19	80.19
08/25/05	11.95	ND	0.00	79.60	79.60
09/12/05	12.42	ND	0.00	79.13	79.13
09/29/05	12.72	ND	0.00	78.83	78.83
11/11/05	9.36	ND	0.00	82.19	82.19
12/02/05	8.50	ND	0.00	83.05	83.05
12/23/05	9.15	ND	0.00	82.40	82.40
01/06/06	8.69	ND	0.00	82.86	82.86
01/19/06	7.99	ND	0.00	83.56	83.56
02/17/06	8.60	ND	0.00	82.95	82.95
02/28/06	9.09	ND	0.00	82.46	82.46
03/17/06	9.89	ND	0.00	81.66	81.66
03/28/06	10.20	ND	0.00	81.35	81.35
04/10/06	10.17	ND	0.00	81.38	81.38
04/28/06	10.24	ND	0.00	81.31	81.31
05/11/06	9.42	ND	0.00	82.13	82.13
05/26/06	7.40	ND	0.00	84.15	84.15
06/05/06	7.16	ND	0.00	84.39	84.39
06/19/06	6.93	ND	0.00	84.62	84.62
07/07/06	8.14	ND	0.00	83.41	83.41
07/18/06	8.10	ND	0.00	83.45	83.45
08/18/06	9.75	ND	0.00	81.80	81.80
08/18/06	12.14	ND	0.00	79.41	79.41
09/01/06	9.78	ND	0.00	81.77	81.77
09/14/06	10.31	ND	0.00	81.24	81.24
10/06/06	10.73	ND	0.00	80.82	80.82
10/20/06	10.65	ND	0.00	80.90	80.90
11/03/06	9.77	ND	0.00	81.78	81.78
11/16/06	8.61	ND	0.00	82.94	82.94
12/01/06	8.70	ND	0.00	82.85	82.85
12/11/06	9.21	ND	0.00	82.34	82.34
12/29/06	9.69	ND	0.00	81.86	81.86
01/10/07	9.25	ND	0.00	82.30	82.30
01/23/07	9.43	ND	0.00	82.12	82.12
02/05/07	10.12	ND	0.00	81.43	81.43
02/28/07	11.03	ND	0.00	80.52	80.52
03/07/07	9.62	ND	0.00	81.93	81.93
03/23/07	9.13	ND	0.00	82.42	82.42
04/05/07	8.92	ND	0.00	82.63	82.63

Table A-6

#### **Groundwater Monitoring Data for Well B-17**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
04/19/07	6.93	ND	0.00	84.62	84.62
05/03/07	8.05	ND	0.00	83.50	83.50
05/17/07	8.56	ND	0.00	82.99	82.99
06/15/07	9.02	ND	0.00	82.53	82.53
06/26/07	9.69	ND	0.00	81.86	81.86
07/10/07	10.27	ND	0.00	81.28	81.28
07/25/07	11.02	ND	0.00	80.53	80.53
08/10/07	11.19	ND	0.00	80.36	80.36
08/24/07	11.63	ND	0.00	79.92	79.92
09/04/07	12.01	ND	0.00	79.54	79.54
09/21/07	12.71	ND	0.00	78.84	78.84
10/16/07	12.15	ND	0.00	79.40	79.40

- 1) Reference Elevation for B-17 is 91.55.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

#### Table A-7

#### **Groundwater Monitoring Data for Well GW-13**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
08/25/05	12.98	ND	0.00	77.73	77.73
09/29/05	13.16	ND	0.00	77.55	77.55
11/15/15	12.35	ND	0.00	78.36	78.36
11/15/05	12.34	ND	0.00	78.37	78.37
11/22/05	12.23	ND	0.00	78.48	78.48
11/22/05	12.23	ND	0.00	78.48	78.48
11/29/05	11.99	ND	0.00	78.72	78.86
11/29/05	11.99	ND	0.00	78.72	78.72
12/02/05	11.86	ND	0.00	78.85	78.85
12/06/05	11.97	ND	0.00	78.74	78.74
12/06/05	11.97	ND	0.00	78.74	78.74
12/13/05	12.24	12.24	0.00	78.47	78.47
12/13/05	12.25	12.25	0.00	78.46	78.46
12/21/05	12.08	ND	0.00	78.63	78.63
12/21/05	12.09	ND	0.00	78.62	78.62
12/27/05	12.01	ND	0.00	78.70	78.70
12/27/05	12.01	ND	0.00	78.70	78.70
01/03/06	11.73	ND	0.00	78.98	78.98
01/03/06	11.74	ND	0.00	78.97	78.97
01/06/06	11.79	ND	0.00	78.92	78.92
01/10/06	12.05	ND	0.00	78.66	78.66
01/10/06	12.04	ND	0.00	78.67	78.67
01/17/06	11.81	ND	0.00	78.90	78.90
01/17/06	11.81	ND	0.00	78.90	78.90
02/17/06	11.75	ND	0.00	78.96	78.96
03/17/06	12.37	ND	0.00	78.34	78.34
04/10/06	12.55	ND	0.00	78.16	78.16
05/26/06	10.61	ND	0.00	80.10	80.10
07/07/06	11.32	ND	0.00	79.39	79.39
07/18/06	11.24	ND	0.00	79.47	79.47
09/14/06	12.34	ND	0.00	78.37	78.37
10/20/06	12.41	ND	0.00	78.30	78.30
11/16/06	11.59	ND	0.00	79.12	79.12
12/01/06	11.65	ND	0.00	79.06	79.06
01/10/07	11.96	ND	0.00	78.75	78.75
01/23/07	9.97	ND	0.00	80.74	80.74
02/28/07	12.55	ND	0.00	78.16	78.16
03/23/07	12.01	ND	0.00	78.70	78.70
04/19/07	10.17	ND	0.00	80.54	80.54
05/17/07	11.59	ND	0.00	79.12	79.12
06/26/07	12.10	ND	0.00	78.61	78.61
07/25/07	12.40	ND	0.00	78.31	78.31
08/24/07	12.67	ND	0.00	78.04	78.04
09/21/07	12.62	ND	0.00	78.09	78.09

- 1) Reference Elevation for GW-13 is 90.57.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Table A-8

## Groundwater Monitoring Data for Well GW-16 Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
10/05/05	12.49	ND	0	78.69	78.69
11/11/05	9.77	ND	0	81.41	81.41
11/17/05	9.93	ND	0	81.25	81.25
11/17/05	9.93	ND	0	81.25	81.25
12/02/05	9.20	ND	0	81.98	81.98
12/02/05	9.20	ND	0	81.98	81.98
12/15/05	9.98	ND	0	81.20	81.20
12/15/05	9.98	ND	0	81.20	81.20
12/23/05	9.71	ND	0	81.47	81.47
12/29/05	9.06	ND	0	82.12	82.12
12/29/05	9.01	ND	0	82.17	82.17
01/06/06	9.16	ND	0	82.02	82.02
01/12/06	9.54	ND	0	81.64	81.64
01/12/06	9.54	ND	0	81.64	81.64
01/19/06	8.74	ND	0	82.44	82.44
01/26/06	9.03	ND	0	82.15	82.15
01/26/06	9.03	ND	0	82.15	82.15
02/10/06	8.32	ND	0	82.86	82.86
02/10/06	8.31	ND	0	82.87	82.87
02/17/06	8.78	ND	0	82.40	82.40
02/23/06	9.11	ND	0	82.07	82.07
02/23/06	9.11	ND	0	82.07	82.07
02/28/06	9.38	ND	0	81.80	81.80
03/09/06	9.91	ND	0	81.27	81.27
03/09/06	9.91	ND	0	81.27	81.27
03/17/06	10.22	ND	0	80.96	80.96
03/23/06	10.35	ND	0	80.83	80.83
03/28/06	10.50	ND	0	80.68	80.68
04/06/06	10.72	ND	0	80.46	80.46
04/06/06	10.69	ND	0	80.49	80.49
04/10/06	10.70	ND	0	80.48	80.48
04/28/06	10.82	ND	0	80.36	80.36
05/05/06	10.43	ND	0	80.75	80.75
05/05/06	10.43	ND	0	80.75	80.75
05/11/06	10.15	ND	0	81.03	81.03
05/18/06	6.13	ND	0	85.05	85.05
05/18/06	6.14	ND	0	85.04	85.04
05/26/06	7.09	ND	0	84.09	84.09
06/01/06	7.73	ND	0	83.45	83.45
06/05/06	7.22	ND	0	83.96	83.96
06/16/06	6.00	ND	0	85.18	85.18
06/16/06	6.00	ND	0	85.18	85.18
06/19/06	6.60	ND	0	84.58	84.58
06/30/06	7.18	ND	0	84.00	84.00
06/30/06	7.19	ND	0	83.99	83.99
07/07/06	7.97	ND	0	83.21	83.21

Table A-8

## Groundwater Monitoring Data for Well GW-16 Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
07/13/06	12.11	ND	0	79.07	79.07
07/13/06	13.01	ND	0	78.17	78.17
07/18/06	8.02	ND	0	83.16	83.16
07/27/06	8.68	ND	0	82.50	82.50
07/27/06	8.66	ND	0	82.52	82.52
08/18/06	9.76	ND	0	81.42	81.42
08/24/06	10.03	ND	0	81.15	81.15
08/24/06	10.03	ND	0	81.15	81.15
09/01/06	10.09	ND	0	81.09	81.09
09/08/06	10.24	ND	0	80.94	80.94
09/08/06	10.25	ND	0	80.93	80.93
09/14/06	10.46	ND	0	80.72	80.72
09/21/06	10.52	ND	0	80.66	80.66
09/21/06	10.52	ND	0	80.66	80.66
10/06/06	10.89	ND	0	80.29	80.29
10/12/06	10.78	ND	0	80.40	80.40
10/12/06	10.78	ND	0	80.40	80.40
10/20/06	10.89	ND	0	80.29	80.29
10/26/06	11.04	ND	0	80.14	80.14
10/26/06	11.04	ND	0	80.14	80.14
11/03/06	10.27	ND	0	80.91	80.91
11/09/06	10.09	ND	0	81.09	81.09
11/09/06	10.09	ND	0	81.09	81.09
11/16/06	9.30	ND	0	81.88	81.88
12/01/06	9.10	ND	0	82.08	82.08
12/08/06	9.41	ND	0	81.77	81.77
12/08/06	9.41	ND	0	81.77	81.77
12/11/06	9.57	ND	0	81.61	81.61
12/21/06	10.09	ND	0	81.09	81.09
12/21/06	10.09	ND	0	81.09	81.09
12/29/06	10.18	ND	0	81.00	81.00
01/04/07	9.88	ND	0	81.30	81.30
01/04/07	9.88	ND	0	81.30	81.30
01/10/07	9.80	ND	0	81.38	81.38
01/18/07	9.83	ND	0	81.35	81.35
01/18/07	9.83	ND	0	81.35	81.35
01/23/07	12.54	ND	0	78.64	78.64
01/31/07	10.36	ND	0	80.82	80.82
01/31/07	10.36	ND	0	80.82	80.82
02/05/07	10.52	ND	0	80.66	80.66
02/28/07	11.13	ND	0	80.05	80.05
03/07/07	10.34	ND	0	80.84	80.84
03/15/07	10.62	ND	0	80.56	80.56
03/15/07	10.62	ND	0	80.56	80.56
03/23/07	10.05	ND	0	81.13	81.13
03/28/07	9.64	ND	0	81.54	81.54

Table A-8

#### **Groundwater Monitoring Data for Well GW-16**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
04/05/07	9.55	ND	0	81.63	81.63
04/10/07	9.23	ND	0	81.95	81.95
04/10/07	9.23	ND	0	81.95	81.95
04/19/07	7.25	ND	0	83.93	83.93
04/27/07	7.98	ND	0	83.20	83.20
04/27/07	7.98	ND	0	83.20	83.20
05/03/07	8.17	ND	0	83.01	83.01
05/08/07	8.53	ND	0	82.65	82.65
05/08/07	8.53	ND	0	82.65	82.65
05/17/07	8.66	ND	0	82.52	82.52
05/23/07	7.75	ND	0	83.43	83.43
05/23/07	7.75	ND	0	83.43	83.43
06/08/07	8.50	ND	0	82.68	82.68
06/08/07	8.50	ND	0	82.68	82.68
06/15/07	9.11	ND	0	82.07	82.07
06/21/07	9.47	ND	0	81.71	81.71
06/21/07	9.45	ND	0	81.73	81.73
06/26/07	9.77	ND	0	81.41	81.41
07/06/07	10.21	ND	0	80.97	80.97
07/10/07	10.36	ND	0	80.82	80.82
07/19/07	10.75	ND	0	80.43	80.43
07/19/07	10.75	ND	0	80.43	80.43
07/25/07	10.97	ND	0	80.21	80.21
08/02/07	11.50	ND	0	79.68	79.68
08/02/07	11.50	ND	0	79.68	79.68
08/10/07	11.15	ND	0	80.03	80.03
08/17/07	11.26	ND	0	79.92	79.92
08/17/07	11.25	ND	0	79.93	79.93
08/24/07	11.44	ND	0	79.74	79.74
08/30/07	11.61	ND	0	79.57	79.57
08/30/07	11.62	ND	0	79.56	79.56
09/04/07	11.74	ND	0	79.44	79.44
09/12/07	11.39	ND	0	79.79	79.79
09/12/07	11.39	ND	0	79.79	79.79
09/21/07	11.60	ND	0	79.58	79.58
09/27/07	11.38	ND	0	79.80	79.80
09/27/07	11.38	ND	0	79.80	79.80
10/11/07	11.93	ND	0	79.25	79.25
10/11/07	11.93	ND	0	79.25	79.25
10/16/07	11.98	ND	0	79.20	79.20

- 1) Reference Elevation for GW-16 is 91.18.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Table A-9

#### **Groundwater Monitoring Data for Well GW-23**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
01/08/01	13.63	13.61	0.02	77.41	77.43
01/06/01	13.82		0	77.22	77.22
01/06/01	13.83		0	77.21	77.21
04/05/02	None	13.59-13.95 Bottom	0.36	N/A	N/A
04/05/02	None	13.58-13.95 Bottom	0.37	N/A	N/A
07/26/02	13.22	13.19	0.03	77.82	77.85
05/30/03	12.61	0.00	0	78.43	78.43

- 1) Reference Elevation for GW-23 is 91.04.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Table A-10

## Groundwater Monitoring Data for Well GW-100 Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
09/29/05	13.06	ND	0	77.09	77.09
10/05/05	13.09	ND	0	77.06	77.06
11/11/05	12.55	ND	0	77.60	77.60
11/11/05	12.53	ND	0	77.62	77.62
11/17/05	12.51	ND	0	77.64	77.64
11/17/05	12.51	ND	0	77.64	77.64
12/02/05	12.34	ND	0	77.81	77.81
12/02/05	12.33	ND	0	77.82	77.82
12/15/05	12.53	ND	0	77.62	77.62
12/15/05	12.55	ND	0	77.60	77.60
12/23/05	12.46	ND	0	77.69	77.69
12/23/05	12.48	ND	0	77.67	77.67
12/29/05	12.30	ND	0	77.85	77.85
12/29/05	12.28	ND	0	77.87	77.87
01/06/06	12.29	ND	0	77.86	77.86
01/06/06	12.28	ND	0	77.87	77.87
01/12/06	12.41	ND	0	77.74	77.74
01/12/06	12.41	ND	0	77.74	77.74
01/19/06	12.15	ND	0	78.00	78.00
01/19/06	12.15	ND	0	78.00	78.00
01/26/06	12.27	ND	0	77.88	77.88
01/26/06	12.27	ND	0	77.88	77.88
02/10/06	11.97	ND	0	78.18	78.18
02/10/06	11.97	ND	0	78.18	78.18
02/17/06	12.25	ND	0	77.90	77.90
02/17/06	12.26	ND	0	77.89	77.89
02/23/06	12.36	ND	0	77.79	77.79
02/23/06	12.37	ND	0	77.78	77.78
02/28/06	12.41	ND	0	77.74	77.74
02/28/06	12.33	ND	0	77.82	77.82
03/09/06	12.53	ND	0	77.62	77.62
03/09/06	12.52	ND	0	77.63	77.63
03/17/06	12.50	ND	0	77.65	77.65
03/17/06	12.49	ND	0	77.66	77.66
03/23/06	12.29	ND	0	77.86	77.86
03/28/06	12.61	ND	0	77.54	77.54
03/28/06	12.61	ND	0	77.54	77.54
04/06/06	12.66	ND	0	77.49	77.49
04/06/06	12.67	ND	0	77.48	77.48
04/10/06	12.72	ND	0	77.43	77.43
04/10/06	12.72	ND	0	77.43	77.43
04/28/06	12.64	ND	0	77.51	77.51
04/28/06	12.64	ND	0	77.51	77.51
05/05/06	12.54	ND	0	77.61	77.61
05/05/06	12.54	ND	0	77.61	77.61
05/11/06	12.44	ND	0	77.71	77.71
05/11/06	12.44	ND	0	77.71	77.71

#### Table A-10

## Groundwater Monitoring Data for Well GW-100 Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
05/18/06	11.07	ND	0	79.08	79.08
05/18/06	11.07	ND	0	79.08	79.08
05/26/06	11.55	ND	0	78.60	78.60
05/26/06	11.56	ND	0	78.59	78.59
06/01/06	11.77	ND	0	78.38	78.38
06/05/06	11.71	ND	0	78.44	78.44
06/05/06	11.71	ND	0	78.44	78.44
06/16/06	11.22	ND	0	78.93	78.93
06/16/06	11.22	ND	0	78.93	78.93
06/19/06	11.43	ND	0	78.72	78.72
06/19/06	11.43	ND	0	78.72	78.72
06/30/06	11.71	ND	0	78.44	78.44
06/30/06	11.72	ND	0	78.43	78.43
07/07/06	11.98	ND	0	78.17	78.17
07/07/06	11.98	ND	0	78.17	78.17
07/13/06	11.64	ND	0	78.51	78.51
07/13/06	11.64	ND	0	78.51	78.51
07/18/06	11.92	ND	0	78.23	78.23
07/18/06	11.92	ND	0	78.23	78.23
07/27/06	12.02	ND	0	78.13	78.13
07/27/06	12.05	ND	0	78.10	78.10
08/18/06	12.41	ND	0	77.74	77.74
08/18/06	12.42	ND	0	77.73	77.73
08/24/06	12.45	ND	0	77.70	77.70
08/24/06	12.45	ND	0	77.70	77.70
09/01/06	12.42	ND	0	77.73	77.73
09/01/06	12.41	ND	0	77.74	77.74
09/08/06	12.41	ND	0	77.74	77.74
09/08/06	12.41	ND	0	77.74	77.74
09/14/06	12.46	ND	0	77.69	77.69
09/14/06	12.46	ND	0	77.69	77.69
09/21/06	12.36	ND	0	77.79	77.79
09/21/06	12.36	ND	0	77.79	77.79
10/06/06	12.58	ND	0	77.57	77.57
10/06/06	12.58	ND	0	77.57	77.57
10/12/06	12.29	ND	0	77.86	77.86
10/12/06	12.29	ND	0	77.86	77.86
10/20/06	12.47	ND	0	77.68	77.68
10/20/06	12.47	ND	0	77.68	77.68
10/26/06	12.46	ND	0	77.69	77.69
10/26/06	12.47	ND	0	77.68	77.68
11/03/06	12.32	ND	0	77.83	77.83
11/03/06	12.32	ND	0	77.83	77.83
11/09/06	12.19	ND	0	77.96	77.96
11/09/06	12.19	ND	0	77.96	77.96
11/16/06	12.08	ND	0	78.07	78.07
11/16/06	12.08	ND	0	78.07	78.07

#### Table A-10

## Groundwater Monitoring Data for Well GW-100 Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
12/01/06	12.10	ND	0	78.05	78.05
12/01/06	12.10	ND	0	78.05	78.05
12/08/06	12.17	ND	0	77.98	77.98
12/08/06	12.18	ND	0	77.97	77.97
12/11/06	12.23	ND	0	77.92	77.92
12/11/06	12.23	ND	0	77.92	77.92
12/21/06	12.34	ND	0	77.81	77.81
12/21/06	12.34	ND	0	77.81	77.81
12/29/06	12.20	ND	0	77.95	77.95
12/29/06	12.21	ND	0	77.94	77.94
01/04/07	12.28	ND	0	77.87	77.87
01/04/07	12.27	ND	0	77.88	77.88
01/10/07	12.23	ND	0	77.92	77.92
01/10/07	12.28	ND	0	77.87	77.87
01/18/07	12.17	ND	0	77.98	77.98
01/18/07	12.17	ND	0	77.98	77.98
01/23/07	12.24	ND	0	77.91	77.91
01/23/07	12.24	ND	0	77.91	77.91
01/31/07	12.38	ND	0	77.77	77.77
01/31/07	12.38	ND	0	77.77	77.77
02/05/07	12.42	ND	0	77.73	77.73
02/05/07	12.42	ND	0	77.73	77.73
02/28/07	12.65	ND	0	77.50	77.50
02/28/07	12.64	ND	0	77.51	77.51
03/07/07	12.36	ND	0	77.79	77.79
03/07/07	12.36	ND	0	77.79	77.79
03/15/07	12.43	ND	0	77.72	77.72
03/15/07	12.43	ND	0	77.72	77.72
03/23/07	12.27	ND	0	77.88	77.88
03/23/07	12.27	ND	0	77.88	77.88
03/28/07	12.14	ND	0	78.01	78.01
03/28/07	12.14	ND	0	78.01	78.01
04/05/07	12.12	ND	0	78.03	78.03
04/05/07	12.12	ND	0	78.03	78.03
04/10/07	12.09	ND	0	78.06	78.06
04/10/07	12.09	ND	0	78.06	78.06
04/19/07	11.38	ND	0	78.77	78.77
04/19/07	11.40	ND	0	78.75	78.75
04/27/07	11.77	ND	0	78.38	78.38
04/27/07	11.77	ND	0	78.38	78.38
05/03/07	11.98	ND	0	78.17	78.17
05/03/07	11.98	ND	0	78.17	78.17
05/08/07	12.02	ND	0	78.13	78.13
05/08/07	12.02	ND	0	78.13	78.13
05/17/07	12.01	ND	0	78.14	78.14
05/17/07	12.00	ND	0	78.15	78.15
05/23/07	11.73	ND	0	78.42	78.42

Table A-10

#### **Groundwater Monitoring Data for Well GW-100**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
05/23/07	11.73	ND	0	78.42	78.42
06/08/07	12.00	ND	0	78.15	78.15
06/08/07	11.99	ND	0	78.16	78.16
06/15/07	12.15	ND	0	78.00	78.00
06/15/07	12.15	ND	0	78.00	78.00
06/21/07	12.22	ND	0	77.93	77.93
06/21/07	12.24	ND	0	77.91	77.91
06/26/07	12.26	ND	0	77.89	77.89
06/26/07	12.26	ND	0	77.89	77.89
07/06/07	12.33	ND	0	77.82	77.82
07/10/07	12.38	ND	0	77.77	77.77
07/10/07	12.38	ND	0	77.77	77.77
07/19/07	12.49	ND	0	77.66	77.66
07/19/07	12.50	ND	0	77.65	77.65
07/25/07	12.35	ND	0	77.80	77.80
07/25/07	12.35	ND	0	77.80	77.80
08/02/07	12.54	ND	0	77.61	77.61
08/02/07	12.54	ND	0	77.61	77.61
08/10/07	12.67	ND	0	77.48	77.48
08/10/07	12.67	ND	0	77.48	77.48
08/17/07	12.61	ND	0	77.54	77.54
08/17/07	12.63	ND	0	77.52	77.52
08/24/07	12.62	ND	0	77.53	77.53
08/24/07	12.62	ND	0	77.53	77.53
08/30/07	12.65	ND	0	77.50	77.50
08/30/07	12.64	ND	0	77.51	77.51
09/04/07	12.68	ND	0	77.47	77.47
09/04/07	12.68	ND	0	77.47	77.47
09/12/07	12.42	ND	0	77.73	77.73
09/12/07	12.43	ND	0	77.72	77.72
09/21/07	12.54	ND	0	77.61	77.61
09/21/07	12.44	ND	0	77.71	77.71
09/27/07	12.36	ND	0	77.79	77.79
09/27/07	12.38	ND	0	77.77	77.77
10/11/07	12.55	ND	0	77.60	77.60
10/11/07	12.55	ND	0	77.60	77.60
10/16/07	12.56	ND	0	77.59	77.59
10/16/07	12.56	ND	0	77.59	77.59

- 1) Reference Elevation for GW100 is 90.15.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness  $\times$  0.95)

Table A-11

## Groundwater Monitoring Data for Well GW-101 Olin Chemical Corporation - Wilmington, MA

<b>D</b> (	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
09/12/05	13.39	ND	0	76.75	76.75
09/16/05	13.28	ND	0	76.86	76.86
09/16/05	13.34	ND	0	76.80	76.80
09/29/05	13.37	ND	0	76.77	76.77
09/29/05	13.42	ND	0	76.72	76.72
10/05/05	13.45	ND	0	76.69	76.69
11/11/05	12.76	ND	0	77.38	77.38
11/11/05	12.53	ND	0	77.61	77.61
11/17/05	12.68	ND	0	77.46	77.46
11/17/05	12.66	ND	0	77.48	77.48
12/02/05	12.45	ND	0	77.69	77.69
12/02/05	12.48	ND	0	77.66	77.66
12/15/05	12.71	ND	0	77.43	77.43
12/15/05	12.61	ND	0	77.53	77.53
12/23/05	12.57	ND	0	77.57	77.57
12/23/05	12.65	ND	0	77.49	77.49
12/29/05	12.47	ND	0	77.67	77.67
12/29/05	12.37	ND	0	77.77	77.77
01/06/06	12.36	ND	0	77.78	77.78
01/06/06	12.43	ND	0	77.71	77.71
01/12/06	12.60	ND	0	77.54	77.54
01/12/06	12.54	ND	0	77.60	77.60
01/19/06	12.20	ND	0	77.94	77.94
01/19/06	12.30	ND	0	77.84	77.84
01/26/06	12.47	ND	0	77.67	77.67
01/26/06	12.39	ND	0	77.75	77.75
02/10/06	12.00	ND	0	78.14	78.14
02/10/05	11.95	ND	0	78.19	78.19
02/17/05	12.29	ND	0	77.85	77.85
02/17/05	12.33	ND	0	77.81	77.81
02/23/06	12.51	ND	0	77.63	77.63
02/23/06	12.46	ND	0	77.68	77.68
02/28/06	12.47	ND	0	77.67	77.67
02/28/06	12.53	ND	0	77.61	77.61
03/09/06	12.71	ND	0	77.43	77.43
03/09/06	12.64	ND	0	77.50	77.50
03/17/06	12.53	ND	0	77.61	77.61
03/17/06	12.59	ND	0	77.55	77.55
03/23/06	12.20	ND	0	77.94	77.94
03/28/06	12.78	ND	0	77.36	77.36
03/28/06	12.82	ND	0	77.32	77.32
04/06/06	12.81	ND	0	77.33	77.33
					77.33
					77.35
					77.28
					77.47
					77.43
04/06/06 04/10/06 04/10/06 04/28/06 04/28/06	12.81 12.79 12.86 12.67 12.71	ND ND ND ND ND	0 0 0 0 0	77.33 77.35 77.28 77.47 77.43	

### Table A-11

## Groundwater Monitoring Data for Well GW-101 Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
05/05/06	12.70	ND	0	77.44	77.44
05/05/06	12.69	ND	0	77.45	77.45
5/112006	12.49	ND	0	77.65	77.65
5/112006	12.53	ND	0	77.61	77.61
05/18/06	11.30	ND	0	78.84	78.84
05/18/06	11.24	ND	0	78.90	78.90
05/26/06	11.62	ND	0	78.52	78.52
05/26/06	11.67	ND	0	78.47	78.47
06/01/06	11.84	ND	0	78.30	78.30
06/05/06	11.70	ND	0	78.44	78.44
06/05/06	11.78	ND	0	78.36	78.36
06/16/06	11.31	ND	0	78.83	78.83
06/16/06	11.21	ND	0	78.93	78.93
06/19/06	11.51	ND	0	78.63	78.63
06/19/06	11.51	ND	0	78.63	78.63
06/30/06	11.83	ND	0	78.31	78.31
06/30/06	11.79	ND	0	78.35	78.35
07/07/06	12.05	ND	0	78.09	78.09
07/07/06	12.07	ND	0	78.07	78.07
07/13/06	11.60	ND	0	78.54	78.54
07/13/06	11.68	ND	0	78.46	78.46
07/18/06	11.79	ND	0	78.35	78.35
07/18/06	11.95	ND	0	78.19	78.19
07/27/06	12.08	ND	0	78.06	78.06
07/27/06	12.03	ND	0	78.11	78.11
08/18/06	12.46	ND	0	77.68	77.68
08/18/06	12.52	ND	0	77.62	77.62
08/24/06	12.57	ND	0	77.57	77.57
08/24/06	12.54	ND	0	77.60	77.60
09/01/06	12.58	ND	0	77.56	77.56
09/01/06	12.56	ND	0	77.58	77.58
09/08/06	12.52	ND	0	77.62	77.62
09/08/06	12.46	ND	0	77.68	77.68
09/14/06	12.56	ND	0	77.58	77.58
09/14/06	12.59	ND	0	77.55	77.55
09/21/06	12.48	ND	0	77.66	77.66
09/21/06	12.44	ND	0	77.70	77.70
10/06/06	12.74	ND	0	77.40	77.40
10/06/06	12.76	ND	0	77.38	77.38
10/12/06	12.46	ND	0	77.68	77.68
10/12/06	12.45	ND	0	77.69	77.69
10/20/06	12.64	ND	0	77.50	77.50
10/20/06	12.73	ND	0	77.41	77.41
10/26/06	12.73	ND	0	77.41	77.41
10/26/06	12.71	ND	0	77.43	77.43
11/03/06	12.51	ND	0	77.63	77.63
11/03/06	12.60	ND	0	77.54	77.54

### Table A-11

## Groundwater Monitoring Data for Well GW-101 Olin Chemical Corporation - Wilmington, MA

-	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
11/09/06	12.39	ND	0	77.75	77.75
11/09/06	12.37	ND	0	77.77	77.77
11/16/06	12.26	ND	0	77.88	77.88
11/16/06	12.34	ND	0	77.80	77.80
12/01/06	12.31	ND	0	77.83	77.83
12/01/06	12.36	ND	0	77.78	77.78
12/08/06	12.43	ND	0	77.71	77.71
12/08/06	12.37	ND	0	77.77	77.77
12/11/06	12.43	ND	0	77.71	77.71
12/11/06	12.48	ND	0	77.66	77.66
12/21/06	12.58	ND	0	77.56	77.56
12/21/06	12.61	ND	0	77.53	77.53
12/29/06	12.18	ND	0	77.96	77.96
12/29/06	12.18	ND	0	77.96	77.96
01/04/07	12.44	ND	0	77.70	77.70
01/04/07	12.57	ND	0	77.57	77.57
01/10/07	12.42	ND	0	77.72	77.72
01/10/07	12.50	ND	0	77.64	77.64
01/18/07	12.44	ND	0	77.70	77.70
01/18/07	12.52	ND	0	77.62	77.62
01/23/07	12.43	ND	0	77.71	77.71
01/23/07	12.55	ND	0	77.59	77.59
01/31/07	12.63	ND	0	77.51	77.51
01/31/07	12.58	ND	0	77.56	77.56
02/05/07	12.63	ND	0	77.51	77.51
02/05/07	12.72	ND	0	77.42	77.42
02/28/07	12.64	ND	0	77.50	77.50
02/28/07	12.71	ND	0	77.43	77.43
03/07/07	12.32	ND	0	77.82	77.82
03/07/07	12.16	ND	0	77.98	77.98
03/15/07	12.61	ND	0	77.53	77.53
03/15/07	12.73	ND	0	77.41	77.41
03/23/07	12.45	ND	0	77.69	77.69
03/23/07	12.51	ND	0	77.63	77.63
03/28/07	12.40	ND	0	77.74	77.74
03/28/07	12.34	ND	0	77.80	77.80
04/04/07	12.25	ND	0	77.89	77.89
04/04/07	12.34	ND	0	77.80	77.80
04/10/07	12.31	ND ND	0	77.83	77.83
04/10/07	12.38	ND ND	0	77.76	77.76
04/10/07	11.57	ND ND	0	78.57	78.57
04/19/07	11.73	ND ND	0	78.41	78.41
			0		
04/27/07	11.88	ND ND		78.26	78.26
04/27/07	11.93	ND ND	0	78.21	78.21
05/03/07	12.17	ND ND	0	77.97	77.97
05/03/07	12.22	ND	0	77.92	77.92
05/08/07	12.23	ND	0	77.91	77.91

Table A-11

#### **Groundwater Monitoring Data for Well GW-101**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
05/08/07	12.25	ND	0	77.89	77.89
05/17/07	12.12	ND	0	78.02	78.02
05/17/07	12.13	ND	0	78.01	78.01
05/23/07	11.97	ND	0	78.17	78.17
05/23/07	11.99	ND	0	78.15	78.15
06/08/07	12.08	ND	0	78.06	78.06
06/08/07	12.18	ND	0	77.96	77.96
06/15/07	12.28	ND	0	77.86	77.86
06/15/07	12.37	ND	0	77.77	77.77
06/21/07	12.36	ND	0	77.78	77.78
06/21/07	12.45	ND	0	77.69	77.69
06/26/07	12.38	ND	0	77.76	77.76
06/26/07	12.37	ND	0	77.77	77.77
07/06/07	12.56	ND	0	77.58	77.58
07/10/07	12.25	ND	0	77.89	77.89
07/10/07	12.56	ND	0	77.58	77.58
07/19/07	12.65	ND	0	77.49	77.49
07/19/07	12.71	ND	0	77.43	77.43
07/25/07	12.69	ND	0	77.45	77.45
07/25/07	12.73	ND	0	77.41	77.41
08/02/07	12.71	ND	0	77.43	77.43
08/02/07	12.79	ND	0	77.35	77.35
08/10/07	12.76	ND	0	77.38	77.38
08/10/07	12.87	ND	0	77.27	77.27
08/17/07	12.73	ND	0	77.41	77.41
08/17/07	12.77	ND	0	77.37	77.37
08/24/07	12.82	ND	0	77.32	77.32
08/24/07	12.90	ND	0	77.24	77.24
08/30/07	12.81	ND	0	77.33	77.33
08/30/07	12.85	ND	0	77.29	77.29
09/04/07	12.86	ND	0	77.28	77.28
09/04/07	12.90	ND	0	77.24	77.24
09/12/07	12.61	ND	0	77.53	77.53
09/12/07	12.67	ND	0	77.47	77.47
09/21/07	12.60	ND	0	77.54	77.54
09/21/07	12.93	ND	0	77.21	77.21
09/27/07	12.61	ND	0	77.53	77.53
09/27/07	12.62	ND	0	77.52	77.52
10/11/07	12.68	ND	0	77.46	77.46
10/11/07	12.71	ND	0	77.43	77.43
10/16/07	12.74	ND	0	77.40	77.40
10/16/07	12.79	ND	0	77.35	77.35

- 1) Reference Elevation for GW101 is 90.14.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Table A-12

Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
09/12/05	12.13	ND	0	76.87	76.87
09/16/05	12.00	ND	0	77.00	77.00
09/16/05	12.09	ND	0	76.91	76.91
09/29/05	12.11	ND	0	76.89	76.89
09/29/05	12.16	ND	0	76.84	76.84
10/05/05	12.20	ND	0	76.80	76.80
11/11/05	11.29	ND	0	77.71	77.71
11/11/05	11.30	ND	0	77.70	77.70
11/17/05	11.23	ND	0	77.77	77.77
11/17/05	11.24	ND	0	77.76	77.76
12/02/05	11.01	ND	0	77.99	77.99
12/02/05	11.02	ND	0	77.98	77.98
12/15/05	11.21	ND	0	77.79	77.79
12/15/05	11.19	ND	0	77.81	77.81
12/23/05	11.13	ND	0	77.87	77.87
12/23/05	11.17	ND	0	77.83	77.83
12/29/05	10.98	ND	0	78.02	78.02
12/29/05	10.96	ND	0	78.04	78.04
01/06/06	10.98	ND	0	78.02	78.02
01/06/06	10.98	ND	0	78.02	78.02
01/12/06	12.41	ND	0	76.59	76.59
01/12/06	11.12	ND	0	77.88	77.88
01/19/06	10.84	ND	0	78.16	78.16
01/19/06	10.85	ND	0	78.15	78.15
01/26/06	11.04	ND	0	77.96	77.96
01/26/06	11.01	ND	0	77.99	77.99
02/10/06	10.58	ND	0	78.42	78.42
02/10/06	10.52	ND	0	78.48	78.48
02/17/06	10.89	ND	0	78.11	78.11
02/17/06	10.93	ND	0	78.07	78.07
02/23/06	11.08	ND	0	77.92	77.92
02/23/06	11.06	ND	0	77.94	77.94
02/28/06	11.10	ND	0	77.90	77.90
02/28/06	11.09	ND	0	77.91	77.91
03/09/06	11.32	ND	0	77.68	77.68
03/09/06	11.27	ND	0	77.73	77.73
03/17/06	11.14	ND	0	77.86	77.86
03/17/06	11.18	ND	0	77.82	77.82
03/23/06	11.03	ND	0	77.97	77.97
03/28/06	11.40	ND	0	77.60	77.60
03/28/06	11.47	ND	0	77.53	77.53
04/06/06	11.48	ND	0	77.52	77.52
04/06/06	11.43	ND	0	77.57	77.57
04/10/06	11.41	ND	0	77.59	77.59
04/10/06	11.51	ND	0	77.49	77.49
04/28/06	11.30	ND	0	77.70	77.70
04/28/06	11.32	ND	0	77.68	77.68

Table A-12

Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
05/05/06	11.31	ND	0	77.69	77.69
05/05/06	10.43	ND	0	78.57	78.57
05/11/06	11.09	ND	0	77.91	77.91
05/11/06	11.13	ND	0	77.87	77.87
05/18/06	10.01	ND	0	78.99	78.99
05/18/06	9.88	ND	0	79.12	79.12
05/26/06	10.30	ND	0	78.70	78.70
05/26/06	10.34	ND	0	78.66	78.66
06/05/06	10.35	ND	0	78.65	78.65
06/05/06	10.46	ND	0	78.54	78.54
06/16/06	9.97	ND	0	79.03	79.03
06/16/06	9.83	ND	0	79.17	79.17
06/19/06	10.20	ND	0	78.80	78.80
06/19/06	10.20	ND	0	78.80	78.80
06/30/06	10.56	ND	0	78.44	78.44
06/30/06	10.44	ND	0	78.56	78.56
07/07/06	10.70	ND	0	78.30	78.30
07/07/06	10.75	ND	0	78.25	78.25
07/13/06	10.20	ND	0	78.80	78.80
07/13/06	10.35	ND	0	78.65	78.65
07/18/06	10.38	ND	0	78.62	78.62
07/18/06	10.59	ND	0	78.41	78.41
07/27/06	10.75	ND	0	78.25	78.25
07/27/06	10.63	ND	0	78.37	78.37
08/18/06	11.15	ND	0	77.85	77.85
08/18/06	11.19	ND	0	77.81	77.81
08/24/06	11.23	ND	0	77.77	77.77
08/24/06	11.23	ND	0	77.77	77.77
09/01/06	11.18	ND	0	77.82	77.82
09/01/06	11.19	ND	0	77.81	77.81
09/08/06	11.14	ND	0	77.86	77.86
09/08/06	11.12	ND	0	77.88	77.88
09/14/06	11.18	ND	0	77.82	77.82
09/14/06	11.18	ND	0	77.82	77.82
09/21/06	11.09	ND	0	77.91	77.91
09/21/06	11.08	ND	0	77.92	77.92
10/06/06	11.30	ND	0	77.70	77.70
10/06/06	11.30	ND	0	77.70	77.70
10/12/06	11.13	ND	0	77.87	77.87
10/12/06	11.12	ND	0	77.88	77.88
10/20/06	11.33	ND	0	77.67	77.67
10/20/06	11.41	ND	0	77.59	77.59
10/26/06	11.43	ND	0	77.57	77.57
10/26/06	11.40	ND	0	77.60	77.60
11/03/06	11.19	ND	0	77.81	77.81
11/03/06	11.24	ND	0	77.76	77.76
11/09/06	11.07	ND	0	77.93	77.93

Table A-12

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
11/09/06	11.04	ND	0	77.96	77.96
11/16/06	10.91	ND	0	78.09	78.09
11/16/06	10.96	ND	0	78.04	78.04
12/01/06	11.01	ND	0	77.99	77.99
12/01/06	11.02	ND	0	77.98	77.98
12/08/06	11.10	ND	0	77.90	77.90
12/08/06	11.06	ND	0	77.94	77.94
12/11/06	11.15	ND	0	77.85	77.85
12/11/06	11.16	ND	0	77.84	77.84
12/21/06	11.24	ND	0	77.76	77.76
12/21/06	11.33	ND	0	77.67	77.67
12/29/06	11.01	ND	0	77.99	77.99
12/29/06	11.01	ND	0	77.99	77.99
01/04/07	11.13	ND	0	77.87	77.87
01/04/07	11.25	ND	0	77.75	77.75
01/10/07	11.12	ND	0	77.88	77.88
01/10/07	11.18	ND	0	77.82	77.82
01/18/07	11.12	ND	0	77.88	77.88
01/18/07	11.24	ND	0	77.76	77.76
01/23/07	11.15	ND	0	77.85	77.85
01/23/07	11.28	ND	0	77.72	77.72
01/31/07	11.30	ND	0	77.70	77.70
01/31/07	11.23	ND	0	77.77	77.77
02/05/07	11.26	ND	0	77.74	77.74
02/05/07	11.40	ND	0	77.60	77.60
02/28/07	11.30	ND	0	77.70	77.70
02/28/07	11.32	ND	0	77.68	77.68
03/07/07	10.94	ND	0	78.06	78.06
03/07/07	10.95	ND	0	78.05	78.05
03/15/07	11.29	ND	0	77.71	77.71
03/15/07	11.44	ND	0	77.56	77.56
03/23/07	11.17	ND	0	77.83	77.83
03/23/07	11.21	ND	0	77.79	77.79
03/28/07	11.06	ND	0	77.94	77.94
03/28/07	11.00	ND	0	78.00	78.00
04/05/07	10.93	ND	0	78.07	78.07
04/05/07	11.03	ND	0	77.97	77.97
04/10/07	10.98	ND	0	78.02	78.02
04/10/07	11.06	ND	0	77.94	77.94
04/19/07	10.26	ND ND	0	78.74	78.74
04/19/07	10.43	ND ND	0	78.57	78.57
04/19/07	10.43	ND ND	0	78.45	78.45
04/27/07	10.66	ND ND	0	78.34	78.34
05/03/07	10.82	ND	0	78.18	78.18
05/03/07	10.92	ND	0	78.08	78.08
05/08/07	10.97	ND	0	78.03	78.03
05/08/07	10.88	ND	0	78.12	78.12

Table A-12

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
05/17/07	10.79	ND	0	78.21	78.21
05/17/07	10.84	ND	0	78.16	78.16
05/23/07	10.63	ND	0	78.37	78.37
05/23/07	10.73	ND	0	78.27	78.27
06/08/07	10.89	ND	0	78.11	78.11
06/08/07	10.89	ND	0	78.11	78.11
06/15/07	10.98	ND	0	78.02	78.02
06/15/07	11.10	ND	0	77.90	77.90
06/21/07	11.06	ND	0	77.94	77.94
06/21/07	11.15	ND	0	77.85	77.85
06/26/07	11.06	ND	0	77.94	77.94
06/26/07	11.06	ND	0	77.94	77.94
07/06/07	11.30	ND	0	77.70	77.70
07/10/07	10.87	ND	0	78.13	78.13
07/10/07	11.29	ND	0	77.71	77.71
07/19/07	11.36	ND	0	77.64	77.64
07/19/07	11.47	ND	0	77.53	77.53
07/25/07	11.42	ND	0	77.58	77.58
07/25/07	11.48	ND	0	77.52	77.52
08/02/07	11.42	ND	0	77.58	77.58
08/02/07	11.49	ND	0	77.51	77.51
08/10/07	11.42	ND	0	77.58	77.58
08/10/07	11.55	ND	0	77.45	77.45
08/17/07	11.43	ND	0	77.57	77.57
08/17/07	11.46	ND	0	77.54	77.54
08/24/07	11.52	ND	0	77.48	77.48
08/24/07	11.60	ND	0	77.40	77.40
08/30/07	11.52	ND	0	77.48	77.48
08/30/07	11.54	ND	0	77.46	77.46
09/04/07	11.56	ND	0	77.44	77.44
09/04/07	11.57	ND	0	77.43	77.43
09/12/07	11.30	ND	0	77.70	77.70
09/12/07	11.37	ND	0	77.63	77.63
09/21/07	11.29	ND	0	77.71	77.71
09/21/07	11.28	ND	0	77.72	77.72
09/27/07	11.35	ND	0	77.65	77.65
09/27/07	11.39	ND	0	77.61	77.61
10/11/07	11.38	ND	0	77.62	77.62
10/11/07	11.41	ND	0	77.59	77.59

- 1) Reference Elevation for GW102 is 89.00.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness  $\times$  0.95)

Table A-13

Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
08/25/05	13.65		` /		
		ND ND	0	77.06	77.06
09/29/05	13.92	ND	0	76.79	76.79
11/15/05	13.07	ND	0	77.64	77.64
11/15/05	13.10	ND	0	77.61	77.61
11/22/05	12.77	ND	0	77.94	77.94
11/22/05	12.79	ND	0	77.92	77.92
11/29/05	12.71	ND	0	78.00	78.00
11/29/05	12.74	ND	0	77.97	77.97
12/02/05	12.57	ND	0	78.14	78.14
12/06/05	12.71	ND	0	78.00	78.00
12/06/05	12.67	ND	0	78.04	78.04
12/13/05	12.84	12.84	0	77.87	77.87
12/13/05	12.86	12.86	0	77.85	77.85
12/21/05	12.74	ND	0	77.97	77.97
12/21/05	12.75	ND	0	77.96	77.96
12/27/05	12.61	ND	0	78.10	78.10
12/27/05	12.64	ND	0	78.07	78.07
01/03/06	12.51	ND	0	78.20	78.20
01/03/06	12.54	ND	0	78.17	78.17
01/06/06	12.46	ND	0	78.25	78.25
01/10/06	12.79	ND	0	77.92	77.92
01/10/06	12.73	ND	0	77.98	77.98
01/17/06	12.51	ND	0	78.20	78.20
01/17/06	12.53	ND	0	78.18	78.18
02/17/06	12.40	ND	0	78.31	78.31
03/17/06	12.71	ND	0	78.00	78.00
04/10/06	13.06	ND	0	77.65	77.65
05/26/06	11.32	ND	0	79.39	79.39
07/18/06	11.58	ND	0	79.13	79.13
08/18/06	12.70	ND	0	78.01	78.01
09/14/06	12.77	ND	0	77.94	77.94
10/20/06	12.95	ND	0	77.76	77.76
11/16/06	12.38	ND	0	78.33	78.33
12/01/06	12.32	ND	0	78.39	78.39
01/10/07	12.65	ND	0	78.06	78.06
02/28/07	12.82	ND	0	77.89	77.89
03/23/07	12.62	ND	0	78.09	78.09
04/19/07	11.13	ND	0	79.58	79.58
05/17/07	11.19	ND	0	78.72	78.72
06/26/07	12.43	ND	0	78.28	78.28
07/25/07	13.05	ND	0	13.05	77.66
08/24/07	13.15	ND ND	0	77.56	77.56
09/21/07	12.87	ND ND	0	77.84	77.84
09/21/07	12.87	ND	U	77.84	77.84

- 1) Reference Elevation for IW-1 is 90.17.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev. (Depth to GW (prod. thickness x 0.95)

**Table A-14** 

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
09/29/05	13.84	ND	0.00	76.69	76.69
11/15/05	13.03	ND	Trace	77.50	77.50
11/15/05	13.08	ND	Trace	77.45	77.45
11/22/05	12.88	ND	0.00	77.65	77.65
11/22/05	12.88	ND	0.00	77.65	77.65
11/29/05	12.74	ND	0.00	77.79	77.79
11/29/05	12.74	ND	0.00	77.79	77.79
12/02/05	12.55	ND	Trace	77.98	77.98
12/06/05	12.66	ND	0.00	77.87	77.87
12/06/05	12.65	ND	0.00	77.88	77.88
12/13/05	12.90	12.90	0.00	77.63	77.63
12/13/05	12.91	12.91	0.00	77.62	77.62
12/21/05	12.79	ND	0.00	77.74	77.74
12/21/05	12.80	ND	0.00	77.73	77.73
12/27/05	11.45	ND	0.00	79.08	79.08
12/27/05	12.68	ND	0.00	77.85	77.85
01/03/06	12.53	ND	0.00	78.00	78.00
01/03/06	12.53	ND	0.00	78.00	78.00
01/06/06	12.50	ND	0.00	78.03	78.03
01/10/06	12.78	ND	0.00	77.75	77.75
01/10/06	12.75	ND	0.00	77.78	77.78
01/17/06	12.51	ND	0.00	78.02	78.02
01/17/06	12.50	ND	0.00	78.03	78.03
02/17/06	12.47	ND	0.00	78.06	78.06
03/17/06	12.81	ND	0.00	77.72	77.72
04/10/06	13.12	ND	0.00	77.41	77.41
05/26/06	11.45	ND	0.00	79.08	79.08
07/18/06	11.73	ND	0.00	78.80	78.80
08/18/06	12.76	ND	0.00	77.77	77.77
09/14/06	12.81	ND	0.00	77.72	77.72
10/20/06	12.98	ND	0.00	77.55	77.55
11/16/06	12.43	ND	0.00	78.10	78.10
12/01/06	12.43	ND	0.00	78.10	78.10
01/10/07	12.64	ND	0.00	77.89	77.89
02/28/07	12.89	ND	0.00	77.64	77.64
03/23/07	12.64	ND	0.00	77.89	77.89
04/19/07	11.46	ND	0.00	79.07	79.07
05/17/07	12.16	ND	0.00	78.37	78.37
06/26/07	12.51	ND	0.00	78.02	78.02
07/25/07	13.04	ND	0.00	77.49	77.49
08/24/07	13.16	Trace	0.00	77.37	77.37
09/21/07	12.92	ND	0.00	77.61	77.61

- 1) Reference Elevation for IW2 is 90.53.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

**Table A-15** 

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
08/25/05	13.63	ND	0	77.13	77.13
09/29/05	13.94	ND	Trace	76.82	76.82
11/15/05	13.16	ND	Trace	77.60	77.60
11/15/05	13.16	ND	Trace	77.60	77.60
11/22/05	13.04	ND	0	77.72	77.72
11/22/05	13.04	ND	0	77.72	77.72
11/29/05	12.86	ND	0	77.90	77.90
11/29/05	12.86	ND	0	77.90	77.90
12/02/05	12.69	ND	0	78.07	78.07
12/06/05	12.81	ND	0	77.95	77.95
12/06/05	12.82	ND	Sheen	77.94	77.94
12/13/05	13.02	13.02	0	77.74	77.74
12/13/05	13.02	12.02	0	77.74	77.74
12/21/05	12.92	ND	0	77.84	77.84
12/21/05	12.93	ND	0	77.83	77.83
12/27/05	12.81	ND	0	77.95	77.95
12/27/05	12.81	ND	0	77.95	77.95
01/03/06	12.51	ND	0	78.25	78.25
01/03/06	12.53	ND	0	78.23	78.23
01/06/06	12.31	ND	0	78.45	78.45
01/10/06	12.83	ND	0	77.93	77.93
01/10/06	12.60	ND	0	78.16	78.16
01/17/06	12.54	ND	0	78.22	78.22
01/17/06	12.43	ND	0	78.33	78.33
02/17/06	12.51	ND	0	78.25	78.25
03/17/06	13.00	ND	0	77.76	77.76
04/10/06	13.30	ND	0	77.46	77.46
05/26/06	11.48	ND	0	79.28	79.28
07/18/06	11.78	ND	0	78.98	78.98
08/18/06	12.75	ND	0	78.01	78.01
09/14/06	12.87	ND	0	77.89	77.89
10/20/06	13.07	ND	0	77.69	77.69
11/16/06	12.32	ND	0	78.44	78.44
12/01/06	12.34	ND	0	78.42	78.42
01/10/07	12.65	ND	0	78.11	78.11
02/28/07	13.10	ND	0	77.66	77.66
03/23/07	12.50	ND	0	78.26	78.26
04/19/07	11.52	ND	0	79.24	79.24
05/17/07	12.05	Trace	0	76.95	76.95
06/26/07	12.51	ND	0	76.49	76.49
07/25/07	13.01	ND	0	75.99	75.99
08/24/07	13.08	ND	0	77.68	77.68
09/21/07	12.87	ND	0	76.13	76.13

- 1) Reference Elevation for IW3 is 90.76.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

# **Groundwater Monitoring Data for Well IW-6**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
12/23/05	11.83	ND	0	78.88	78.88
01/06/06	11.59	ND	0	79.12	79.12
01/19/06	11.47	ND	0	79.24	79.24
02/17/06	11.60	ND	0	79.11	79.11
02/28/06	11.76	ND	0	78.95	78.95
03/17/06	11.84	ND	0	78.87	78.87
03/28/06	11.89	ND	0	78.82	78.82
04/10/06	12.05	ND	0	78.66	78.66
04/28/06	11.76	ND	0	78.95	78.95
05/11/06	11.76	ND	0	78.95	78.95
05/26/06	10.88	ND	0	79.83	79.83
06/05/06	11.00	ND	0	79.71	79.71
06/19/06	10.73	ND	0	79.98	79.98
07/07/06	11.29	ND	0	79.42	79.42
07/18/06	11.26	ND	0	79.45	79.45
08/18/06	11.73	ND	0	78.98	78.98
09/01/06	11.73	ND	0	78.98	78.98
09/14/06	11.88	ND	0	78.83	78.83
10/06/06	11.95	ND	0	78.76	78.76
10/20/06	11.73	ND	0	78.98	78.98
11/03/06	11.57	ND	0	79.14	79.14
11/16/06	11.32	ND	0	79.39	79.39
12/01/06	11.35	ND	0	79.36	79.36
12/11/06	11.49	ND	0	79.22	79.22
12/29/06	11.16	ND	0	79.55	79.55
01/10/07	11.46	ND	0	79.25	79.25
01/23/07	11.45	ND	0	79.26	79.26
02/05/07	11.65	ND	0	79.06	79.06
02/28/07	12.00	ND	0	78.71	78.71
03/07/07	11.73	ND	0	78.98	78.98
03/23/07	11.48	ND	0	79.23	79.23
04/05/07	11.33	ND	0	79.38	79.38
04/19/07	10.69	ND	0	80.02	80.02
05/03/07	11.19	ND	0	79.52	79.52
05/17/07	11.21	ND	0	79.50	79.50
06/15/07	11.38	ND	0	79.33	79.33
06/26/07	11.49	ND	0	79.22	79.22
07/10/07	11.58	ND	0	79.13	79.13
07/25/07	11.42	ND	0	79.29	79.29
08/10/07	11.15	ND	0	79.56	79.56
08/24/07	11.84	ND	0	78.87	78.87
09/04/07	11.88	ND	0	78.83	78.83
09/21/07	11.75	ND	0	78.96	78.96
10/16/07	11.78	ND	0	78.93	78.93

- 1) Reference Elevation for IW6 is 89.15.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
12/23/05	13.06	ND	0	77.04	77.04
01/06/06	12.85	ND	0	77.25	77.25
01/19/06	12.57	ND	0	77.53	77.53
02/17/06	12.83	ND	0	77.27	77.27
02/28/06	12.98	ND	0	77.12	77.12
03/17/06	13.01	ND	0	77.09	77.09
03/28/06	13.06	ND	0	77.04	77.04
04/10/06	13.25	ND	0	76.85	76.85
04/28/06	13.14	ND	0	76.96	76.96
05/11/06	12.93	ND	Trace	77.17	77.17
05/26/06	12.01	ND	0	78.09	78.09
06/05/06	12.10	ND	0	78.00	78.00
06/19/06	11.85	ND	0	78.25	78.25
07/07/06	12.41	12.75	Trace	77.69	77.69
07/18/06	12.40	ND	0	77.70	77.70
08/18/06	12.91	ND	0	77.19	77.19
09/01/06	12.89	ND	0	77.21	77.21
09/14/06	12.98	ND	0	77.12	77.12
10/06/06	13.21	ND	0	76.89	76.89
10/20/06	12.83	ND	0	77.27	77.27
11/03/06	12.69	ND	0	77.41	77.41
11/16/06	12.44	ND	0	77.66	77.66
12/01/06	12.46	ND	0	77.64	77.64
12/11/06	12.58	ND	0	77.52	77.52
12/29/06	11.95	ND	0	78.15	78.15
01/10/07	12.56	ND	0	77.54	77.54
01/23/07	12.45	ND	0	77.65	77.65
02/05/07	12.77	ND	0	77.33	77.33
02/28/07	13.15	ND	0	76.95	76.95
03/07/07	12.82	ND	0	77.28	77.28
03/23/07	12.59	ND	0	77.51	77.51
04/05/07	12.42	ND	0	77.68	77.68
04/19/07	11.79	ND	0	78.31	78.31
05/03/07	12.29	ND	0	77.81	77.81
05/17/07	12.26	ND	0	77.84	77.84
06/15/07	12.42	ND	0	77.68	77.68
06/26/07	12.50	ND	0	77.60	77.60
07/10/07	12.60	ND	0	77.50	77.50
07/25/07	12.33	ND	0	77.77	77.77
08/10/07	13.38	ND	0	76.72	76.72
08/24/07	12.91	ND	0	77.19	77.19
09/04/07	12.94	ND	0	77.16	77.16
09/21/07	12.76	ND	0	77.34	77.34
10/16/07	12.81	ND	0	77.29	77.29

- 1) Reference Elevation for IW7 is 90.1.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

# **Groundwater Monitoring Data for Well IW-8**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
12/23/05	12.79	ND	0	77.15	77.15
01/06/06	12.54	ND	0	77.40	77.40
01/19/06	12.26	ND	0	77.68	77.68
02/17/06	12.48	ND	Trace	77.46	77.46
02/28/06	12.66	ND	Trace	77.28	77.28
03/17/06	12.72	ND	0	77.22	77.22
03/28/06	12.93	ND	0	77.01	77.01
04/10/06	13.00	ND	Trace	76.94	76.94
04/28/06	12.83	ND	Trace	77.11	77.11
05/11/06	12.60	ND	Trace	77.34	77.34
05/26/06	11.66	ND	Trace	78.28	78.28
06/05/06	11.75	ND	Trace	78.19	78.19
06/19/06	11.50	ND	Trace	78.44	78.44
07/07/06	12.12	ND	Trace	77.82	77.82
07/18/06	12.04	ND	Trace	77.90	77.90
08/18/06	12.63	12.62	0	77.31	77.31
09/01/06	12.60	ND	Trace	77.34	77.34
09/14/06	12.63	12.62	Trace	77.31	77.31
10/06/06	12.94	12.92	0	77.00	77.00
10/20/06	12.70	12.69	Trace	77.24	77.24
11/03/06	12.55	ND	Trace	77.39	77.39
11/16/06	12.26	ND	Trace	77.68	77.68
12/01/06	12.28	ND	Trace	77.66	77.66
12/11/06	12.41	ND	Trace	77.53	77.53
12/29/06	11.94	ND	Trace	78.00	78.00
01/10/07	12.41	ND	0	77.53	77.53
01/23/07	12.48	ND	0	77.46	77.46
02/05/07	12.66	ND	0	77.28	77.28
02/28/07	12.74	ND	0	77.20	77.20
03/07/07	12.40	ND	0	77.54	77.54
03/23/07	12.42	ND	0	77.52	77.52
04/05/07	12.25	ND	0	77.69	77.69
04/19/07	11.59	ND	0	78.35	78.35
05/03/07	12.14	ND	0	77.80	77.80
05/17/07	12.11	ND	0	77.83	77.83
06/15/07	12.28	Trace	0	77.66	77.66
06/26/07	12.31	Trace	0	77.63	77.63
07/10/07	12.48	Trace	0	77.46	77.46
07/25/07	12.58	ND	0	77.36	77.36
08/10/07	12.96	Trace	0	76.98	76.98
08/24/07	12.84	Trace	0	77.10	77.10
09/04/07	12.89	Trace	0	77.05	77.05
09/21/07	12.58	ND	0	77.36	77.36
10/16/07	12.67	ND	0	77.27	77.27

- 1) Reference Elevation for IW8 is 89.94.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness  $\times$  0.95)

# **Groundwater Monitoring Data for Well IW-9**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
12/23/05	12.23	ND	0	77.55	77.55
01/06/06	11.97	ND	0	77.81	77.81
01/19/06	11.65	ND	0	78.13	78.13
02/17/06	11.88	ND	0	77.90	77.90
02/28/06	12.06	ND	0	77.72	77.72
03/17/06	12.09	ND	0	77.69	77.69
03/28/06	12.41	ND	0	77.37	77.37
04/10/06	12.34	ND	0	77.44	77.44
04/28/06	12.18	ND	0	77.60	77.60
05/11/06	11.98	ND	0	77.80	77.80
05/26/06	11.07	ND	0	78.71	78.71
06/05/06	11.20	ND	0	78.58	78.58
06/19/06	19.91	ND	0	69.87	69.87
07/07/06	11.51	ND	0	78.27	78.27
07/18/06	11.33	ND	0	78.45	78.45
08/18/06	12.19	ND	0	77.59	77.59
09/01/06	12.18	ND	0	77.60	77.60
09/14/06	12.20	ND	0	77.58	77.58
10/06/06	12.38	ND	0	77.40	77.40
10/20/06	12.38	ND	0	77.40	77.40
11/03/06	12.22	ND	0	77.56	77.56
11/16/06	11.94	ND	0	77.84	77.84
12/01/06	11.95	ND	0	77.83	77.83
12/11/06	12.11	ND	0	77.67	77.67
12/29/06	11.76	ND	0	78.02	78.02
01/10/07	11.76	ND	0	78.02	78.02
01/23/07	12.20	ND	0	77.58	77.58
02/05/07	12.36	ND	0	77.42	77.42
02/28/07	12.16	ND	0	77.62	77.62
03/07/07	11.71	ND	0	78.07	78.07
03/23/07	12.08	ND	0	77.70	77.70
04/05/07	11.85	ND	0	77.93	77.93
04/19/07	11.06	ND	0	78.72	78.72
05/03/07	11.75	ND	0	78.03	78.03
05/17/07	11.76	ND	0	78.02	78.02
06/15/07	11.93	ND	0	77.85	77.85
06/26/07	11.81	ND	0	77.97	77.97
07/10/07	12.11	ND	0	77.67	77.67
07/25/07	12.39	ND	0	77.39	77.39
08/10/07	12.49	ND	0	77.29	77.29
08/24/07	12.53	ND	0	77.25	77.25
09/04/07	12.55	ND	0	77.23	77.23
09/21/07	12.16	ND	0	77.62	77.62
10/16/07	12.39	ND	0	77.39	77.39

- 1) Reference Elevation for IW9 is 89.78.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

# **Groundwater Monitoring Data for Well IW-10**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
12/23/05	12.45	ND	0	77.98	77.98
01/06/06	12.28	ND	0	78.15	78.15
01/19/06	12.04	ND	0	78.39	78.39
02/17/06	12.21	ND	0	78.22	78.22
02/28/06	12.39	ND	0	78.04	78.04
03/17/06	12.49	ND	0	77.94	77.94
03/28/06	12.68	ND	0	77.75	77.75
04/10/06	12.69	ND	0	77.74	77.74
04/28/06	12.60	ND	0	77.83	77.83
05/11/06	12.38	ND	0	78.05	78.05
05/26/06	11.55	ND	0	78.88	78.88
06/05/06	11.69	ND	0	78.74	78.74
06/19/06	11.41	ND	0	79.02	79.02
07/07/06	11.96	ND	0	78.47	78.47
07/18/06	11.82	ND	0	78.61	78.61
08/18/06	12.51	ND	0	77.92	77.92
09/01/06	12.50	ND	0	77.93	77.93
09/14/06	12.50	ND	0	77.93	77.93
10/06/06	12.61	ND	0	77.82	77.82
10/20/06	12.69	ND	0	77.74	77.74
11/03/06	12.54	ND	0	77.89	77.89
11/16/06	12.27	ND	0	78.16	78.16
11/01/06	12.32	ND	0	78.11	78.11
12/11/06	12.46	ND	0	77.97	77.97
12/29/06	12.38	ND	0	78.05	78.05
01/10/07	12.48	ND	0	77.95	77.95
01/23/07	12.54	ND	0	77.89	77.89
02/05/07	12.67	ND	0	77.76	77.76
02/28/07	12.61	ND	0	77.82	77.82
03/07/07	12.24	ND	0	78.19	78.19
03/23/07	12.45	ND	0	77.98	77.98
04/05/07	12.27	ND	0	78.16	78.16
04/19/07	11.53	ND	0	78.90	78.90
05/03/07	12.18	ND	0	78.25	78.25
05/17/07	12.18	ND	0	78.25	78.25
06/15/07	12.18	ND	0	78.23	78.04
06/26/07	12.36	ND ND	0	78.07	78.07
07/10/07	12.58	ND ND	0	77.85	77.85
07/25/07	12.79	ND ND	0	77.64	77.64
08/10/07	12.79	ND ND	0	77.63	77.63
08/10/07	12.87	ND ND	0	77.56	77.56
09/04/07	12.92	ND ND	0	77.51	77.51
09/04/07	12.68	ND ND	0	77.75	77.75
10/16/07	12.80	ND ND	0	77.63	77.63
10/16/07	12.80	ND	U	11.03	17.03

- 1) Reference Elevation for IW10 is 90.43.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

Table A-21

Olin Chemical Corporation - Wilmington, MA

Date	(feet BGS)	(feet BGS)	Thickness (feet)	Groundwater	Elevation
	Depth to Water	Depth to Product	Product	Elevation	Corrected GW
01/31/01	14.90		0	75.02	75.02
01/06/01	14.90	14.88	0.02	75.02	75.04
01/06/01	14.16		0	75.76	75.76
01/06/01	14.91		0	75.01	75.01
01/22/01	14.90	14.88	0.02	75.02	75.04
01/31/01	14.95		0	74.97	74.97
01/31/01	14.74		0	75.18	75.18
01/31/01	14.96		0	74.96	74.96
01/31/01	15.02		0	74.90	74.90
01/31/01	14.82		0	75.10	75.10
01/31/01	14.97		0	74.95	74.95
01/31/01	14.82		0	75.10	75.10
01/31/01	14.93		0	74.99	74.99
04/06/01	13.18	13.16	0.02	76.74	76.76
04/20/01	13.61	13.60	0.01	76.31	76.32
07/26/02	13.39	13.38	0.01	76.53	76.54

- 1) Reference Elevation for IW11 is 89.92.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness  $\times$  0.95)

Table A-22

Olin Chemical Corporation - Wilmington, MA

Date	Depth to Water (feet BGS)	Depth to Product (feet BGS)	Product Thickness (feet)	Groundwater Elevation	Corrected GW Elevation
01/06/01	16.10	16.08	0.02	74.21	74.23
01/06/01	16.06	16.05	0.01	74.25	74.26
01/06/01	16.17	16.16	0.01	74.14	74.15
01/22/01	16.10	16.08	0.02	74.21	74.23
01/22/01	16.17	16.16	0.01	74.14	74.15
01/22/01	15.72		0	74.59	74.59
01/31/01	15.95		0	74.36	74.36
01/31/01	15.97		0	74.34	74.34
01/31/01	15.80		0	74.51	74.51
01/31/01	15.92		0	74.39	74.39
01/31/01	16.00		0	74.31	74.31
01/31/01	15.99		0	74.32	74.32
04/06/01	14.25	14.22	0.03	76.06	76.09
04/20/01	15.74	15.73	0.01	74.57	74.58
07/26/02	15.21	15.20	0.01	75.10	75.11

- 1) Reference Elevation for IW12 is 90.31.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

# **Groundwater Monitoring Data for Well IW-13**

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
01/06/01	13.37	13.33	0.04	76.53	76.57
01/22/01	13.37	13.33	0.04	76.53	76.57
04/06/01	11.80	11.72	0.08	78.10	78.18
04/20/01	11.33	11.29	0.04	78.57	78.61
02/15/02	12.78	ND	0	77.12	77.12
07/26/02	13.07	13.06	0.01	76.83	76.84

- 1) Reference Elevation for IW13 is 89.9.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness  $\times$  0.95)

Table A-24

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
02/19/04	13.07	ND	0	76.90	76.90
03/31/04	13.25	ND	0	76.72	76.72
04/29/04	11.99	ND	0	77.98	77.98
05/27/04	13.24	ND	0	76.73	76.73
07/14/04	13.49	ND	0	76.48	76.48
09/24/04	13.19	ND	0	76.78	76.78
11/04/04	13.19	ND	0	76.78	76.78
12/03/04	13.66	ND	0	76.31	76.31
01/13/05	13.60	13.59	0.01	76.37	76.38
02/23/05	12.92	ND	0	77.05	77.05
03/31/05	12.16	ND	0	77.81	77.81
04/21/05	12.76	ND	0	77.21	77.21
05/20/05	12.69	ND	0	77.28	77.28
06/14/05	12.50	ND	0	77.47	77.47
07/27/05	12.89	ND	0	77.08	77.08
08/25/05	13.35	ND	0	76.62	76.62
09/29/05	13.47	ND	0	76.50	76.50
12/02/05	12.81	ND	0	77.16	77.16
01/06/06	12.74	ND	0	77.23	77.23
02/17/06	12.74	ND	0	77.23	77.23
03/17/06	12.97	ND	0	77.00	77.00
04/10/06	13.26	ND	0	76.71	76.71
05/26/06	11.84	ND	0	78.13	78.13
07/07/06	12.35	ND	0	77.62	77.62
07/18/06	12.28	ND	0	77.69	77.69
08/18/06	12.87	12.87	Trace	77.10	77.10
09/14/06	12.89	12.89	Trace	77.08	77.08
10/20/06	12.88	12.88	Trace	77.09	77.09
11/16/06	12.41	12.40	0.01	77.56	77.57
12/01/06	12.42	12.42	Trace	77.55	77.55
01/10/07	12.55	ND	0	77.42	77.42
02/28/07	13.07	ND	0	76.90	76.90
03/23/07	12.58	ND	0	77.39	77.39
04/19/07	11.63	ND	0	78.34	78.34
05/17/07	12.21	ND	0	77.76	77.76
06/26/07	12.44	Trace	0	77.53	77.53
07/25/07	12.46	12.45	0	77.51	77.51
08/24/07	12.96	Trace	0	77.01	77.01
09/21/07	12.75	ND	0	77.22	77.22

- 1) Reference Elevation for PID is 89.97.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness x 0.95)

**Table A-25** 

Olin Chemical Corporation - Wilmington, MA

	Depth to Water	Depth to Product	Product	Groundwater	Corrected GW
Date	(feet BGS)	(feet BGS)	Thickness (feet)	Elevation	Elevation
02/19/04	13.15	13.14	0.01	77.30	77.31
03/31/04	13.41	ND	0.00	77.04	77.04
04/29/04	11.82	ND	0.00	78.63	78.63
05/27/04	12.86	ND	0.00	77.59	77.59
07/14/04	13.58	13.52	0.06	76.87	76.93
09/24/04	13.30	13.26	0.04	77.15	77.19
11/04/04	13.44	13.44	Trace	77.01	77.01
12/05/04	13.53	ND	Trace	76.92	76.92
01/13/05	13.82	13.78	0.04	76.63	76.63
02/23/05	13.30	12.84	0.46	77.15	77.15
03/31/05	12.14	ND	0.00	78.31	78.31
04/21/05	12.83	12.66	0.17	77.62	77.62
05/20/05	12.79	12.78	0.01	77.66	77.66
06/14/05	12.63	12.50	0.13	77.82	77.82
07/27/05	13.45	12.98	0.47	77.00	77.00
08/25/05	13.71	13.70	0.01	76.74	76.74
09/29/05	13.16	13.90	0.00	77.29	77.29
12/02/05	12.61	ND	Trace	77.84	77.84
01/06/06	12.41	ND	0.00	78.04	78.04
02/17/06	12.47	ND	Trace	77.98	77.98
03/17/06	12.83	ND	0.00	77.62	77.62
04/10/06	13.18	ND	Trace	77.27	77.27
05/26/06	11.52	ND	0.00	78.93	78.93
07/07/06	12.05	ND	Trace	78.40	78.40
07/18/06	11.95	11.87	0.00	78.50	78.50
08/18/06	12.82	12.75	0.07	77.63	77.63
09/14/06	13.10	12.85	0.25	77.35	77.35
10/20/06	13.19	13.00	0.19	77.26	77.26
11/16/06	12.43	ND	0.00	78.02	78.02
12/01/06	12.43	12.42	0.01	78.02	78.02
01/10/07	12.66	ND	0	77.79	77.79
02/28/07	12.92	12.91	Trace	77.53	77.53
03/23/07	12.82	12.77	0	77.63	77.63
04/19/07	11.40	Trace	0	79.05	79.05
05/17/07	11.28	Trace	0	79.17	79.17
06/26/07	12.55	Trace	0	77.90	77.90
07/25/07	13.16	13.05	0	77.29	77.29
08/24/07	13.45	13.21	0	77.00	77.00
09/21/07	12.98	12.97	0	77.47	77.47

- 1) Reference Elevation for P-5 is 90.45.
- 2) Measurements taken from top of PVC or casing.
- 3) Corrected GW = Ref. Elev.-(Depth to GW-(prod. thickness  $\times$  0.95)

#### MPE-21 AS/SVE Field Monitoring Data

Olin Chemical Corp. - Wilmington, MA

		MPE-21						
DATE	SYSTEM STATUS		VAC	CONC	CO <sub>2</sub>	$O_2$	CH <sub>4</sub>	A.S.
	(S/D)	TIME	("H <sub>2</sub> O)	(ppmv)	(%)	(%)	(%)	(on/off)
03-Aug-05	D	13:50	4.0	6.1	NM	NM	NM	OFF
18-Aug-05	D	11:59	4.0	2.1	NM	NM	NM	OFF
01-Sep-05	D	11:34	4.0	53.8	NM	NM	NM	OFF
16-Sep-05	D	13:20	3.5	8.5	NM	NM	NM	OFF
05-Oct-05	D	10:39	3.0	119.8	NM	NM	NM	OFF
17-Nov-05	D	11:43	4.0	13.0	NM	NM	NM	OFF
01-Dec-05	D	10:30	3.0	4.2	NM	NM	NM	OFF
15-Dec-05	D	12:00	4.0	1.6	NM	NM	NM	OFF
29-Dec-05	D	10:43	4.0	1.5	NM	NM	NM	OFF
12-Jan-06	D	13;15	4.0	2.0	NM	NM	NM	OFF
26-Jan-06	D	10:59	4.0	0.6	NM	NM	NM	OFF
09-Feb-06	D	14:00	4.0	ND	NM	NM	NM	OFF
23-Feb-06	D	10:49	4.0	ND	NM	NM	NM	OFF
09-Mar-06	D	NM	4.0	ND	NM	NM	NM	OFF
23-Mar-06	D	10:40	3.5	ND	NM	NM	NM	OFF
06-Apr-06	D	10:40	4.0	12.0	NM	NM	NM	OFF
04-May-06	D	15:10	4.0	7.0	NM	NM	NM	OFF
18-May-06	D	9:27	6.0	ND	NM	NM	NM	OFF
01-Jun-06	D	11:31	4.5	ND	NM	NM	NM	OFF
15-Jun-06	D	14:40	6.0	<1	NM	NM	NM	OFF
29-Jun-06	D	13:39	5.0	ND	NM	NM	NM	OFF
07-Jul-06	D	NM	4.0	ND	NM	NM	NM	ON
13-Jul-06	D	11:44	4.5	ND	NM	NM	NM	OFF
18-Jul-06	D	NM	4.2	ND	NM	NM	NM	OFF
27-Jul-06	D	11:34	6.0	ND	NM	NM	NM	OFF
24-Aug-06	D	11:31	5.5	ND	NM	NM	NM	OFF
07-Sep-06	D	14:52	5.0	4.1	NM	NM	NM	OFF
21-Sep-06	D	NM	NM	3.0	NM	NM	NM	OFF
12-Oct-06	D	NM	5.0	4.7	NM	NM	NM	OFF
26-Oct-06	D	10:37	NM	9.9	NM	NM	NM	OFF
09-Nov-06	D	10:01	5.0	ND	NM	NM	NM	OFF
08-Dec-06	D	9:22	0.0	ND	NM	NM	NM	OFF
21-Dec-06	D	NM	5.0	4.2	NM	NM	NM	OFF
04-Jan-07	D	NM	5.0	ND	NM	NM	NM	OFF
18-Jan-07	D	9:10	5.0	<1	NM	NM	NM	OFF
31-Jan-07	D	9:32	5.0	1.0	NM	NM	NM	OFF
15-Mar-07	D	10:35	5.0	1.5	NM	NM	NM	OFF
28-Mar-07	D	10:35	6.0	ND	NM	NM	NM	OFF
10-Apr-07	D	9:30	6.0	ND	NM	NM	NM	OFF
27-Apr-07	D	9:55	7.0	ND	NM	NM	NM	OFF
08-May-07	D	10:31	6.5	1.1	NM	NM	NM	OFF
23-May-07	D	NM	7.0	ND	NM	NM	NM	OFF
08-Jun-07	D	NM	6.5	ND	NM	NM	NM	OFF
21-Jun-07	D	NM	6.0	ND	NM	NM	NM	OFF
06-Jul-07	D	10:15	6.0	0.8	NM	NM	NM	OFF
19-Jul-07	D	13:10	5.5	2.3	NM	NM	NM	OFF
02-Aug-07	D	NM	5.5	2.8	NM	NM	NM	OFF
17-Aug-07	D	NM	5.5	8.9	NM	NM	NM	OFF
30-Aug-07	D	NM	5.3	7.3	NM	NM	NM	OFF
12-Sep-07	D	NM	5.0	13.7	NM	NM	NM	OFF
21-Sep-07	D	NM	5.0	0.0	NM	NM	NM	OFF
27-Sep-07	D	NM	5.0	4.3	NM	NM	NM	OFF
11-Oct-07	D	NM	4.8	14.4	NM	NM	NM	OFF

NOTES:

Concentrations measured with a Thermo Environmental Model 580B Organic Vapor Meter (OVM), equipped with a photoionization detector (PID) utilizing a 10.6 eV lamp. Concentrations reported in parts-per-million by volume (ppmv). CO2, O2 and CH4 measured with a Landtec GA-90 gas monitor

ND NM ON/OFF

Not detected.

Not measured.

Air Sparging System operation
Indicates dynamic (D) or static (S) soil gas condition during the soil gas survey. D/S

#### MPE-22 AS/SVE Field Monitoring Data

Olin Chemical Corp. - Wilmington, MA

		MPE-22						
DATE	SYSTEM STATUS		VAC	CONC	CO <sub>2</sub>	$O_2$	CH <sub>4</sub>	A.S.
	(S/D)	TIME	("H <sub>2</sub> O)	(ppmv)	(%)	(%)	(%)	(on/off)
03-Aug-05	D	13:48	4.0	3.6	NM	NM	NM	OFF
18-Aug-05	D	11:58	4.0	1.3	NM	NM	NM	OFF
01-Sep-05	D	11:30	4.0	15.8	NM	NM	NM	OFF
16-Sep-05	D	13:18	3.5	3.3	NM	NM	NM	OFF
05-Oct-05	D	10:41	3.0	65.6	NM	NM	NM	OFF
17-Nov-05	D	11:40	4.0	12.0	NM	NM	NM	OFF
01-Dec-05	D	11:18	3.0	6.2	NM	NM	NM	OFF
15-Dec-05	D	12:04	4.0	4.3	NM	NM	NM	OFF
29-Dec-05	D	10:41	4.0	3.2	NM	NM	NM	OFF
12-Jan-06	D	13:17	4.0	2.3	NM	NM	NM	OFF
26-Jan-06	D	10:58	4.0	0.5	NM	NM	NM	OFF
09-Feb-06	D	13:55	4.0	ND	NM	NM	NM	OFF
23-Feb-06	D	10:51	4.0	ND	NM	NM	NM	OFF
09-Mar-06	D	NM	4.0	1.4	NM	NM	NM	OFF
23-Mar-06	D	10:42	3.5	ND	NM	NM	NM	OFF
06-Apr-06	D	10:43	4.0	8.4	NM	NM	NM	OFF
04-May-06	D	15:15	4.0	4.0	NM	NM	NM	OFF
18-May-06	D	9:30	6.0	ND	NM	NM	NM	OFF
01-Jun-06	D	11:29	4.5	ND	NM	NM	NM	OFF
15-Jun-06	D	14:38	6.0	1.0	NM	NM	NM	OFF
29-Jun-06	D	13:41	5.0	3.9	NM	NM	NM	OFF
07-Jul-06	D	NM	4.0	NM	NM	NM	NM	ON
13-Jul-06	D	11:48	4.5	1.8	NM	NM	NM	OFF
18-Jul-06	D	NM	4.2	NM	NM	NM	NM	OFF
27-Jul-06	D	11:36	6.0	ND	NM	NM	NM	OFF
24-Aug-06	D	11:37	5.5	ND	NM	NM	NM	OFF
07-Sep-06	D	14:48	5.0	1.9	NM	NM	NM	OFF
21-Sep-06	D	NM	NM	2.6	NM	NM	NM	OFF
12-Oct-06	D	NM	5.0	6.0	NM	NM	NM	OFF
26-Oct-06	D	10:41	NM	8.1	NM	NM	NM	OFF
09-Nov-06	D	10:03	5.0	3.0	NM	NM	NM	OFF
08-Dec-06	D	9:25	0.0	ND	NM	NM	NM	OFF
21-Dec-06	D	NM	5.0	4.1	NM	NM	NM	OFF
04-Jan-07	D	NM	5.0	2.4	NM	NM	NM	OFF
18-Jan-07	D	9:15	5.0	<1	NM	NM	NM	OFF
31-Jan-07	D	9:36	5.0	4.7	NM	NM	NM	OFF
15-Mar-07	D	10:39	5.0	7.5	NM	NM	NM	OFF
28-Mar-07	D	10:37	6.0	ND	NM	NM	NM	OFF
10-Apr-07	D	9:33	6.0	ND	NM	NM	NM	OFF
27-Apr-07	D	10:00	7.0	ND	NM	NM	NM	OFF
08-May-07	D	10:33	6.5	1.4	NM	NM	NM	OFF
23-May-07	D	NM	7.0	ND	NM	NM	NM	OFF
08-Jun-07	D	NM	6.0	ND	NM	NM	NM	OFF
21-Jun-07	D	NM 10.20	6.0	ND	NM	NM	NM	OFF
06-Jul-07	D	10:20	6.0	2.8	NM	NM	NM	OFF
19-Jul-07	D	10:10	6.0	6.5	NM	NM	NM	OFF
02-Aug-07	D	NM	5.8	7.6	NM	NM	NM	OFF
17-Aug-07	D	NM	5.0	7.1	NM	NM	NM	OFF
30-Aug-07	D	NM	5.0	11.7	NM	NM	NM	OFF
12-Sep-07	D	NM	5.0	11.8	NM	NM	NM	OFF
21-Sep-07	D	NM	5.0	1.5	NM	NM	NM	OFF
27-Sep-07	D	NM	5.5	11.1	NM	NM	NM	OFF
11-Oct-07	D	NM	5.0	6.2	NM	NM	NM	OFF

NOTES:

Concentrations measured with a Thermo Environmental Model 580B Organic Vapor Meter (OVM), equipped with a photoionization detector (PID) utilizing a 10.6 eV lamp. Concentrations reported in parts-per-million by volume (ppmv). CO2, O2 and CH4 measured with a Landtec GA-90 gas monitor Not detected. Not measured.

ND NM

ON/OFF Air Sparging System operation

#### MPE-23 AS/SVE Field Monitoring Data

Olin Chemical Corp. - Wilmington, MA

		MPE-23							
DATE	SYSTEM STATUS		VAC	CONC	CO <sub>2</sub>	$O_2$	CH <sub>4</sub>	A.S,	
	(S/D)	TIME	("H <sub>2</sub> O)	(ppmv)	(%)	(%)	(%)	(on/off)	
03-Aug-05	D	13:51	4.0	1.3	NM	NM	NM	OFF	
18-Aug-05	D	11:57	4.0	1.0	NM	NM	NM	OFF	
01-Sep-05	D	11:39	4.0	2.2	NM	NM	NM	OFF	
16-Sep-05	D	13:22	3.5	4.0	NM	NM	NM	OFF	
05-Oct-05	D	10:43	3.0	5.5	NM	NM	NM	OFF	
17-Nov-05	D	11:46	3.5	ND	NM	NM	NM	OFF	
01-Dec-05	D	10:49	3.0	1.2	NM	NM	NM	OFF	
15-Dec-05	D	12:08	3.0	0.3	NM	NM	NM	OFF	
29-Dec-05	D	10:45	4.0	<1	NM	NM	NM	OFF	
12-Jan-06	D	13:18	4.0	<1	NM	NM	NM	OFF	
26-Jan-06	D	11:00	4.0	ND	NM	NM	NM	OFF	
09-Feb-06	D	14:05	4.0	ND	NM	NM	NM	OFF	
23-Feb-06	D	10:54	4.0	ND	NM	NM	NM	OFF	
09-Mar-06	D	NM	4.0	ND	NM	NM	NM	OFF	
23-Mar-06	D	10:45	3.5	ND	NM	NM	NM	OFF	
06-Apr-06	D	10:45	4.0	1.2	NM	NM	NM	OFF	
04-May-06	D	15:12	4.0	ND	NM	NM	NM	OFF	
18-May-06	D	9:35	6.0	ND	NM	NM	NM	OFF	
01-Jun-06	D	11:33	4.5	ND	NM	NM	NM	OFF	
15-Jun-06	D	14:42	6.0	ND	NM	NM	NM	OFF	
29-Jun-06	D	13:45	5.0	ND	NM	NM	NM	OFF	
07-Jul-06	D	NM	4.0	ND	NM	NM	NM	OFF	
13-Jul-06	D	11:51	4.5	ND	NM	NM	NM	OFF	
18-Jul-06	D	NM	4.4	ND	NM	NM	NM	OFF	
27-Jul-06	D	11:39	6.0	ND	NM	NM	NM	OFF	
24-Aug-06	D	11:40	0.0	ND	NM	NM	NM	OFF	
07-Sep-06	D	14:54	5.0	ND	NM	NM	NM	OFF	
21-Sep-06	D	NM	NM	<1	NM	NM	NM	OFF	
12-Oct-06	D	NM	4.0	ND	NM	NM	NM	OFF	
26-Oct-06	D D	10:48 10:06	NM 5.0	ND ND	NM NM	NM	NM	OFF OFF	
09-Nov-06 08-Dec-06	D	9:30	5.0	ND ND	NM NM	NM NM	NM NM	OFF	
21-Dec-06	D	9.30 NM	5.0	1.1	NM	NM	NM	OFF	
04-Jan-07	D	NM	5.0	ND	NM	NM	NM	OFF	
18-Jan-07	D	9:17	5.0	<1	NM	NM	NM	OFF	
31-Jan-07	D	9:39	5.0	<1	NM	NM	NM	OFF	
15-Mar-07	D	10:44	5.0	<1	NM	NM	NM	OFF	
28-Mar-07	D	10:39	6.0	ND	NM	NM	NM	OFF	
10-Apr-07	D	9:37	6.0	ND	NM	NM	NM	OFF	
27-Apr-07	D	10:04	7.0	ND	NM	NM	NM	OFF	
08-May-07	D	10:36	6.5	ND	NM	NM	NM	OFF	
23-May-07	D	NM	7.0	ND	NM	NM	NM	OFF	
08-Jun-07	D	NM	6.5	ND	NM	NM	NM	OFF	
21-Jun-07	D	NM	6.0	ND	NM	NM	NM	OFF	
06-Jul-07	D	10:25	6.0	0.1	NM	NM	NM	OFF	
19-Jul-07	D	10:10	6.0	0.4	NM	NM	NM	OFF	
02-Aug-07	D	NM	5.5	0.0	NM	NM	NM	OFF	
17-Aug-07	D	NM	5.5	1.6	NM	NM	NM	OFF	
30-Aug-07	D D	NM NM	5.5	0.0	NM NM	NM NM	NM NM	OFF	
12-Sep-07 21-Sep-07	D D	NM NM	5.0	1.6 0.0	NM NM	NM NM	NM NM	OFF OFF	
27-Sep-07 27-Sep-07	D	NM	5.0	0.0	NM NM	NM NM	NM NM	OFF	
11-Oct-07	D	NM	5.0	1.1	NM	NM	NM	OFF	
11 001-07	D	1 1171	5.0	1.1	1 1171	1 1171	1 4141	511	

NOTES:

Concentrations measured with a Thermo Environmental Model 580B Organic Vapor Meter (OVM), equipped with a photoionization detector (PID) utilizing a 10.6 eV lamp. Concentrations reported in parts-per-million by volume (ppmv). CO2, O2 and CH4 measured with a Landtec GA-90 gas monitor

ND NM Not detected. Not measured.

ON/OFF Air Sparging System operation

#### MPE-24 AS/SVE Field Monitoring Data

Olin Chemical Corp. - Wilmington, MA

		MPE-24						
DATE	SYSTEM STATUS		VAC	CONC	CO <sub>2</sub>	$O_2$	CH <sub>4</sub>	A.S,
	(S/D)	TIME	("H <sub>2</sub> O)	(ppmv)	(%)	(%)	(%)	(on/off)
03-Aug-05	D	11:02	4.0	3.1	NM	NM	NM	OFF
18-Aug-05	D	11:55	4.0	7.0	NM	NM	NM	OFF
01-Sep-05	D	11:27	4.0	10.0	NM	NM	NM	OFF
16-Sep-05	D	13:16	3.5	13.0	NM	NM	NM	OFF
05-Oct-05	D	10:45	3.5	17.4	NM	NM	NM	OFF
17-Nov-05	D	11:36	4.0	2.0	NM	NM	NM	OFF
01-Dec-05	D	10:47	3.0	2.7	NM	NM	NM	OFF
15-Dec-05	D	12;11	4.0	0.5	NM	NM	NM	OFF
29-Dec-05	D	10:39	4.0	<1	NM	NM	NM	OFF
12-Jan-06	D	13:20	4.0	<1	NM	NM	NM	OFF
26-Jan-06	D	10:57	4.0	ND	NM	NM	NM	OFF
09-Feb-06	D	13:50	4.0	ND	NM	NM	NM	OFF
23-Feb-06	D	10:57	4.0	ND	NM	NM	NM	OFF
09-Mar-06	D	NM	4.0	ND	NM	NM	NM	OFF
23-Mar-06	D	10:48	3.5	ND	NM	NM	NM	OFF
06-Apr-06	D	10:48	4.0	2.0	NM	NM	NM	OFF
04-May-06	D	15:18	4.0	1.0	NM	NM	NM	OFF
18-May-06	D	9:39	6.0	ND	NM	NM	NM	OFF
01-Jun-06	D	11:27	4.5	ND	NM	NM	NM	OFF
15-Jun-06	D	14:36	6.0	ND	NM	NM	NM	OFF
29-Jun-06	D	13:48	5.0	2.6	NM	NM	NM	OFF
07-Jul-06	D	NM	4.0	ND	NM	NM	NM	ON
13-Jul-06	D	11:54	4.5	ND	NM	NM	NM	OFF
18-Jul-06	D	NM	4.3	ND	NM	NM	NM	OFF
27-Jul-06	D	11:41	6.0	ND	NM	NM	NM	OFF
24-Aug-06	D	11:42	5.5	ND	NM	NM	NM	OFF
07-Sep-06	D	14:46	5.0	0.6	NM	NM	NM	OFF
21-Sep-06	D	NM	NM	1.6	NM	NM	NM	OFF
12-Oct-06	D	NM	5.0	2.2	NM	NM	NM	OFF
26-Oct-06	D	10:53	NM	2.6	NM	NM	NM	OFF
09-Nov-06	D	10:10	5.0	ND	NM	NM	NM	OFF
08-Dec-06	D	9:32	0.0	ND	NM	NM	NM	OFF
21-Dec-06	D	NM	5.0	1.4	NM	NM	NM	OFF
04-Jan-07	D	NM	5.0	ND	NM	NM	NM	OFF
18-Jan-07	D	9:21	5.0	<1	NM	NM	NM	OFF
31-Jan-07	D	9:43	5.0	<1	NM	NM	NM	OFF
15-Mar-07	D	10:47	5.0	1.1	NM	NM	NM	OFF
28-Mar-07	D	10:46	6.0	ND	NM	NM	NM	OFF
10-Apr-07	D	9:41	6.0	ND	NM	NM	NM	OFF
27-Apr-07	D	10:08	7.0	ND	NM	NM	NM	OFF
08-May-07	D	10:38	6.5	1.5	NM	NM	NM	OFF
23-May-07	D	NM	7.0	ND	NM	NM	NM	OFF
08-Jun-07	D	NM	6.0	ND	NM	NM	NM	OFF
21-Jun-07	D	NM	6.0	ND	NM	NM	NM	OFF
06-Jul-07	D	10:30	6.0	0.5	NM	NM	NM	OFF
19-Jul-07	D	13:05	6.0	1.7	NM	NM	NM	OFF
02-Aug-07	D	NM	5.3	0.0	NM	NM	NM	OFF
17-Aug-07	D	NM	5.3	4.6	NM	NM	NM	OFF
30-Aug-07	D	NM	5.3	0.0	NM	NM	NM	OFF
12-Sep-07	D	NM	5.0	6.3	NM	NM	NM	OFF
21-Sep-07	D	NM	5.0	0.0	NM	NM	NM	OFF
27-Sep-07	D	NM	5.0	2.8	NM	NM	NM	OFF
11-Oct-07	D	NM	5.0	0.7	NM	NM	NM	OFF

NOTES:

Concentrations measured with a Thermo Environmental Model 580B Organic Vapor Meter (OVM), equipped with a photoionization detector (PID) utilizing a 10.6 eV lamp. Concentrations reported in parts-per-million by volume (ppmv).

CO2, O2 and CH4 measured with a Landtec GA-90 gas monitor

ND Not detected. NM Not measured.

ON/OFF Air Sparging System operation

#### MPE-25 AS/SVE Field Monitoring Data

Olin Chemical Corp. - Wilmington, MA

DATE		MPE-25								
L	SYSTEM STATUS		VAC	CONC	CO <sub>2</sub>	$O_2$	CH <sub>4</sub>	A.S.		
	(S/D)	TIME	("H <sub>2</sub> O)	(ppmv)	(%)	(%)	(%)	(on/off)		
03-Aug-05	D	13:44	4.0	2.7	NM	NM	NM	OFF		
18-Aug-05	D	11:51	4.0	4.5	NM	NM	NM	OFF		
01-Sep-05	D	11:23	4.0	3.3	NM	NM	NM	OFF		
16-Sep-05	D	13:14	3.5	5.0	NM	NM	NM	OFF		
05-Oct-05	D	10:50	3.5	11.0	NM	NM	NM	OFF		
17-Nov-05	D	11:33	4.0	ND	NM	NM	NM	OFF		
01-Dec-05	D	10:40	3.0	2.9	NM	NM	NM	OFF		
15-Dec-05	D	12:14	4.0	0.3	NM	NM	NM	OFF		
29-Dec-05	D	10:35	4.0	<1	NM	NM	NM	OFF		
12-Jan-06	D	13:21	4.0	0.7	NM	NM	NM	OFF		
26-Jan-06	D	10:56	4.0	ND	NM	NM	NM	OFF		
09-Feb-06	D	13:45	4.0	ND	NM	NM	NM	OFF		
23-Feb-06	D	11:00	4.0	ND	NM	NM	NM	OFF		
09-Mar-06	D	NM	4.0	ND	NM	NM	NM	OFF		
23-Mar-06	D	10:50	4.0	ND	NM	NM	NM	OFF		
06-Apr-06	D	10:50	4.0	ND	NM	NM	NM	OFF		
04-May-06	D	15:20	4.0	ND	NM	NM	NM	OFF		
18-May-06	D	9:42	6.0	ND	NM	NM	NM	OFF		
01-Jun-06	D	11:24	4.5	ND	NM	NM	NM	OFF		
15-Jun-06	D	14:34	6.0	ND	NM	NM	NM	OFF		
29-Jun-06	D	13:50	5.0	ND	NM	NM	NM	OFF		
07-Jul-06	D	NM	4.0	ND	NM	NM	NM	ON		
13-Jul-06	D	11:56	4.5	ND	NM	NM	NM	OFF		
18-Jul-06	D	NM	4.4	ND	NM	NM	NM	OFF		
27-Jul-06	D	11:44	6.0	ND	NM	NM	NM	OFF		
24-Aug-06	D	11:45	0.0	ND	NM	NM	NM	OFF		
07-Sep-06	D	14:43	5.0	ND	NM	NM	NM	OFF		
21-Sep-06	D	NM	NM	<1	NM	NM	NM	OFF		
12-Oct-06	D	NM	5.0	ND	NM	NM	NM	OFF		
26-Oct-06	D	10:58	NM	ND	NM	NM	NM	OFF		
09-Nov-06	D	10:15	5.0	ND	NM	NM	NM	OFF		
08-Dec-06	D	9:34	5.0	ND	NM	NM	NM	OFF		
21-Dec-06	D	NM	5.0	ND	NM	NM	NM	OFF		
04-Jan-07	D	NM	5.0	ND	NM	NM	NM	OFF		
18-Jan-07	D	9:25	5.0	<1	NM	NM	NM	OFF		
31-Jan-07	D	9:52	5.0	1.2	NM	NM	NM	OFF		
15-Mar-07	D	10:52	5.0	<1 ND	NM	NM	NM	OFF		
28-Mar-07	D	10:49	6.0	ND	NM NM	NM	NM	OFF		
10-Apr-07	D	9:45	6.0	ND	NM	NM	NM	OFF		
27-Apr-07	D D	10:10 10:40	7.0	ND 1.4	NM NM	NM NM	NM NM	OFF OFF		
08-May-07	D D		7.0	1.4 ND	NM NM	NM NM		OFF		
23-May-07	D D	NM NM			NM NM		NM NM			
08-Jun-07		NM NM	7.0	ND ND	NM NM	NM NM	NM NM	OFF		
21-Jun-07 06-Jul-07	D D	NM 10:35	6.0	0.4	NM NM	NM NM	NM NM	OFF		
19-Jul-07	D	13:05	1	0.4				OFF		
02-Aug-07	D	NM	6.0 5.5	0.3	NM NM	NM NM	NM NM	OFF		
17-Aug-07	D	NM	5.8	2.0	NM NM	NM	NM	OFF		
30-Aug-07	D	NM	5.8	0.0	NM NM	NM	NM	OFF		
12-Sep-07	D	NM	5.0	1.4	NM	NM	NM	OFF		
21-Sep-07	D	NM	5.0	0.0	NM NM	NM	NM	OFF		
27-Sep-07	D	NM	5.5	4.3	NM	NM	NM	OFF		
27-5cp-07	D	NM	5.0	0.7	NM	NM	NM	OFF		

NOTES:

Concentrations measured with a Thermo Environmental Model 580B Organic Vapor Meter (OVM), equipped with a photoionization detector (PID) utilizing a 10.6 eV lamp. Concentrations reported in parts-per-million by volume (ppmv). CO2, O2 and CH4 measured with a Landtec GA-90 gas monitor

ND NM ON/OFF D/S Not detected. Not measured.

Air Sparging System operation
Indicates dynamic (D) or static (S) soil gas condition during the soil gas survey.

#### **Combined SVE Influent Air Monitoring Data**

Olin Chemical Corp. - Wilmington, MA

		Combined Influent (C-1)				
	SYSTEM STATUS		PRESSURE	CONC		
DATE	(S/D)	TIME	("H <sub>2</sub> O)	(ppm)		
09-Mar-06	D	10:38	0.7	ND		
23-Mar-06	D	10:31	0.7	ND		
06-Apr-06	D	10:28	0.6	2.6		
04-May-06	D	14:55	0.7	4.5		
18-May-06	D	9:16	0.5	ND		
01-Jun-06	D	11:18	0.6	ND		
15-Jun-06	D	14:27	0.6	<1		
29-Jun-06	D	14:55	0.5	2.7		
13-Jul-06	D	11:30	0.6	ND		
27-Jul-06	D	11:28	0.5	ND		
24-Aug-06	D	11:18	0.0	ND		
07-Sep-06	D	14:33	0.5	3.3		
21-Sep-06	D	0:00	0.5	1.9		
12-Oct-06	D	0:00	0.5	2.5		
26-Oct-06	D	10:09	0.5	4.8		
09-Nov-06	D	9:48	0.5	ND		
08-Dec-06	D	9:10	0.7	ND		
21-Dec-06	D	0:00	0.7	1.0		
04-Jan-07	D	0:00	0.7	ND		
10-Jan-07	D	NM	1.0	0.2		
18-Jan-07	D	8:54	0.8	<1		
23-Jan-07	D	NM	1.0	0.0		
31-Jan-07	D	9:24	0.6	1.2		
05-Feb-07	D	NM	0.8	2.0		
28-Feb-07	D	NM	1.0	0.0		
07-Mar-07	D	NM	1.8	2.0		
15-Mar-07	D	9:20	0.8	3.1		
23-Mar-07	D	NM	0.7	0.0		
28-Mar-07	D	10:20	0.7	ND		
10-Apr-07	D	9:15	0.3	ND		
27-Apr-07	D	9:20	0.0	ND		
08-May-07	D	10:29	0.6	1.1		
23-May-07	D	NM	0.5	ND		
08-Jun-07	D	NM	0.7	ND		
21-Jun-07	D	NM	0.8	ND		
06-Jul-07	D	10:08	0.8	0.2		
19-Jul-07	D	12:55	0.7	2.8		
02-Aug-07	D	NM	0.8	4.4		
17-Aug-07	D	NM	0.9	7.1		
30-Aug-07	D	NM	0.8	4.8		
12-Sep-07	D	NM	0.6	9.0		
27-Sep-07	D	NM	0.7	2.5		
11-Oct-07	D	NM	0.8	8.6		

NOTES: Concentrations measured with a Thermo Environmental Model 580B Organic

Vapor Meter (OVM), equipped with a photoionization detector (PID) utilizing a 10.6 eV lamp. Concentrations reported in parts-per-million by volume (ppmv). Calibrated to isobutylene.

ND Not detected. NM Not measured.

Air Sparging System operation ON/OFF

#### **SVE System Effluent Air Monitoring Data**

Olin Chemical Corp. - Wilmington, MA

	SYSTEM STATUS		PRESSURE	CONC
DATE	(S/D)	TIME	("H <sub>2</sub> O)	(ppm)
09-Mar-06	D	10:43	0.1	ND
23-Mar-06	D	10:37	0.1	ND
06-Apr-06	D	10:34	0.1	ND
04-May-06	D	15:05	0.1	ND
18-May-06	D	9:23	0.1	ND
01-Jun-06	D	11:12	0.1	ND
16-Jun-06	D	14:25	0.1	ND
29-Jun-06	D	14:00	0.1	ND
13-Jul-06	D	11:39	0.1	ND
27-Jul-06	D	11:32	0.1	ND
24-Aug-06	D	11:28	0.0	ND
07-Sep-06	D	14:26	0.1	ND
21-Sep-06	D	Not Noted	0.1	<1
10-Oct-06	D	Not Noted	0.1	ND
26-Oct-06	D	10:32	0.1	ND
09-Nov-06	D	9:57	0.0	ND
08-Dec-06	D	9:20	0.0	ND
21-Dec-06	D	Not Noted	0.0	ND
04-Jan-07	D	Not Noted	0.0	ND
10-Jan-07	D	Not Noted	0.0	0.0
18-Jan-07	D	9:02	0.0	<1
23-Jan-07	D	Not Noted	0.0	0.0
31-Jan-07	D	9:31	0.0	<1
05-Feb-07	D	Not Noted	0.0	0.0
28-Feb-07	D	Not Noted	0.0	0.0
07-Mar-07	D	Not Noted	0.0	0.0
15-Mar-07	D	9:30	0.0	<1
23-Mar-07	D	Not Noted	0.0	0.0
28-Mar-07	D	10:30	0.0	ND
10-Apr-07	D	9:25	0.0	ND
27-Apr-07	D	9:35	0.0	ND
08-May-07	D	10:25	0.0	1.6
23-May-07	D	Not Noted	0.0	ND
08-Jun-07	D	Not Noted	0.0	ND
21-Jun-07	D	Not Noted	0.0	ND
06-Jul-07	D	10:10	0.0	ND
19-Jul-07	D	13:00	0.0	ND
02-Aug-07	D	Not Noted	0.0	ND
17-Aug-07	D	Not Noted	0.0	ND
30-Aug-07	D	Not Noted	0.0	ND
12-Sep-07	D	Not Noted	0.0	0.0
27-Sep-07	D	Not Noted	0.0	0.0
11-Oct-07	D	Not Noted	0.0	0.0

NOTES: Concentrations measured with a Thermo Environmental Model 580B Organic

 $Vapor\ Meter\ (OVM),\ equipped\ with\ a\ photoionization\ detector\ (PID)\ utilizing\ a$   $10.6\ eV\ lamp.\ Concentrations\ reported\ in\ parts-per-million\ by\ volume\ (ppmv).$ 

Calibrated to isobutylene.

ND Not detected. NM Not measured.

ON/OFF Air Sparging System operation

#### NAPL Area Influent Air Monitoring Data

Olin Chemical Corp. - Wilmington, MA

			NAPL Area Influent	
	SYSTEM STATUS		VAC	CONC
DATE	(S/D)	TIME	("H <sub>2</sub> O)	(ppm)
09-Mar-06	D	10:35	5.0	ND
23-Mar-06	D	10:27	4.1	ND
06-Apr-06	D	10:23	4.0	2.1
04-May-06	D	14:50	4.0	3.0
18-May-06	D	9:13	6.0	ND
01-Jun-06	D	11:21	4.8	ND
15-Jun-06	D	14:31	6.0	<1
29-Jun-06	D	14:50	6.0	2.3
13-Jul-06	D	11:24	5.0	ND
27-Jul-06	D	11:26	7.0	ND
24-Aug-06	D	11:11	6.0	ND
07-Sep-06	D	14:30	10.0	1.6
21-Sep-06	D	NM	10.0	1.8
12-Oct-06	D	NM	10.0	1.8
26-Oct-06	D	10:14	0.0	4.4
09-Nov-06	D	9:45	10.0	ND
08-Dec-06	D	9:06	0.0	ND
21-Dec-06	D	NM	8.0	ND
04-Jan-07	D	NM	10.0	ND
10-Jan-07	D	NM	0.5	0.0
18-Jan-07	D	8:50	10.0	<1
31-Jan-07	D	9:20	10.0	<1
04-Jan-07	D	NM	10.0	ND
15-Mar-07	D	9:16	6.0	3.2
28-Mar-07	D	10:45	7.0	ND
10-Apr-07	D	9:10	7.0	ND
27-Apr-07	D	9:15	7.0	ND
08-May-07	D	10:20	7.0	1.2
23-May-07	D	NM	7.0	ND
08-Jun-07	D	NM	7.0	ND
21-Jun-07	D	NM	7.0	ND
06-Jul-07	D	10:10	7.0	0.2
19-Jul-07	D	12:55	6.0	3.0
02-Aug-07	D	NM	6.0	3.9
17-Aug-07	D	NM	6.0	7.3
30-Aug-07	D	NM	6.0	2.5
12-Sep-07	D	NM	6.0	4.1
27-Sep-07	D	NM	6.0	2.3
11-Oct-07	D	NM	6.5	5.6

NOTES: Concentrations measured with a Thermo Environmental Model 580B Organic

Vapor Meter (OVM), equipped with a photoionization detector (PID) utilizing a 10.6 eV lamp. Concentrations reported in parts-per-million by volume (ppmv). Calibrated to isobutylene.

ND Not detected. NM Not measured.

ON/OFF Air Sparging System operation

#### **EPH/VPH Area Influent Air Monitoring Data**

Olin Chemical Corp. - Wilmington, MA

			EPH/VPH Area Influent	
	SYSTEM STATUS		VAC	CONC
DATE	(S/D)	TIME	("H <sub>2</sub> O)	(ppm)
15-Apr-04	D	NM	NM	NM
29-Apr-04	D	13:36	7.5	0.7
06-May-04	D	NM	7.0	0.3
14-May-04	D	11:48	6.5	1.1
20-May-04	D	10:48	6.0	2.8
27-May-04	D	13:52	6.0	3.0
03-Jun-04	D	14:56	6.0	4.2
10-Jun-04	D	11:48	6.0	2.7
17-Jun-04	D	11:49	6.0	4.4
24-Jun-04	D	11:48	5.5	5.4
01-Jul-04	D	15:38	6.0	4.2
08-Jul-04	D	14:40	5.0	4.6
15-Jul-04	NM	NM	NM	NM
27-Aug-04	D	13:12	5.0	1.3
02-Sep-04	D	14:18	6.0	24.0
16-Sep-04	D	14:34	6.0	ND
24-Sep-04	D	13:22	6.0	3.3
30-Sep-04	D	15:10	7.0	7.0
08-Oct-04	D	11:28	6.0	3.0
15-Oct-04	D	13:39	6.0	13.9
22-Oct-04	D	11:24	6.5	0.6
28-Oct-04	D	11:38	6.0	1.1
04-Nov-04	D	11:50	6.5	0.9
12-Nov-04	D	10:50	7.0	0.3
19-Nov-04	NM	NM	NM	NM
24-Nov-04	D	10:50	6.0	1.7
09-Dec-04	D	NM	6.0	2.7
23-Dec-04	D	NM	7.0	2.0
05-Jan-05	D	11:50	6.0	<1
20-Jan-05	D	14:28	7.0	<1
03-Feb-05	D	10:37	7.0	ND
09-Feb-05	D	11:17	6.0	ND
03-Mar-05	D	NM	6.0	0.0
17-Mar-05	D	NM	7.0	0.0
01-Apr-05	D	NM	7.0	NM
14-Apr-05	D	10:56	6.0	2.3
28-Apr-05	D	11:27	6.0	0.3
12-May-05	D	NM	6.0	1.6
26-May-05	D	11:23	7.0	2.1
09-Jun-05	D	11;10	7.0	2.5
22-Jun-05	D	13:37	6.0	5.5
07-Jul-05	D	14:26	5.0	3.3
25-Jul-05	D	14:20	5.0	6.0
03-Aug-05	D	13:57	5.0	8.6
18-Aug-05	D	11:44	5.0	8.0
01-Dec-05	D	NM	7.0	38.0

NOTES: Concentrations measured with a Thermo Environmental Model 580B Organic

Vapor Meter (OVM), equipped with a photoionization detector (PID) utilizing a 10.6 eV lamp. Concentrations reported in parts-per-million by volume (ppmv).

Calibrated to isobutylene.

ND Not detected. NM Not measured.

ON/OFF Air Sparging System operation

Table E-1

<u>Flow Rate Calculations</u> Olin Chemical Corporation - Wilmington, MA

Date	Front or Rear	Inlet Pressure (''H2O)	delta Pressure (''H2O)	Temperature °F	System Flow Rate (scfm) <sup>1</sup>	Front & Rear Combined Flow Rate (scfm)
5/12/05	F R	6.0 6.0	0.40 0.15	62 52	82.43 50.97	133.40
5/26/05	F	7.0	0.40	52	83.33	
3/20/03	R	7.0	0.40	52	41.67	125.00
6/9/05	F	7.0	0.40	74	81.60	
0/ 5/ 03	R	6.0	0.10	74	40.75	122.35
6/22/05	F	6.0	0.30	67	71.05	442.04
	R	5.0	0.10	67	40.97	112.01
7/7/05	F	5.0	0.40	67	81.93	122.00
	R	4.5	0.10	67	40.94	122.88
7/13/05	F	5.0	0.50	86	90.00	153.64
	R	5.0	0.25	86	63.64	133.04
7/25/05	F	5.0	0.35	86	75.30	115.55
	R	5.0	0.10	86	40.25	113.33
8/3/05	F	5.0	0.35	97	74.55	114.35
	R	4.0	0.10	97	39.80	
8/10/05	F	5.0	0.50	112	87.93	150.10
0/10/07	R	5.0	0.25	112	62.18	
8/18/05	F R	5.0 4.0	0.35 0.10	80 80	75.71 40.42	116.14
8/25/05	F	0.0	0.00	0	0.00	
0/23/03	R	1.0	0.00	86	63.32	63.32
9/1/05	F	0.0	0.00	0	0.00	
<i>y,</i> 1, 00	R	4.0	0.10	76	40.57	40.57
9/11/05	F	0.0	0.00	0	0.00	62.42
	R	3.8	0.25	88	63.43	63.43
9/16/05	F	0.0	0.00	0	0.00	40.02
	R	4.0	0.10	67	40.92	40.92
9/30/05	F	0.0	0.00	0	0.00	64.61
	R	5.2	0.25	70	64.61	07.01
10/5/05	F	0.0	0.00	0	0.00	41.07
	R	4.0	0.10	63	41.07	.110,
11/17/05	F	0.0	0.00	0	0.00	41.47
	R	4.0	0.10	53	41.47	
12/1/05	F	7.0	0.00	48	0.00	41.83
12/15/05	R	7.0	0.10	48	41.83 0.00	
12/13/03	R	7.0	0.00	36	66.93	66.93
12/29/05	F	0.0	0.00	0	0.00	
12/29/03	R	7.0	0.00	48	51.23	51.23
1/12/06	F	0.0	0.00	0	0.00	
1/12/00	R	7.0	0.00	49	51.18	51.18

Table E-1

<u>Flow Rate Calculations</u> Olin Chemical Corporation - Wilmington, MA

Date	Front or Rear	Inlet Pressure ("H2O)	delta Pressure (''H2O)	Temperature °F	System Flow Rate (scfm) <sup>1</sup>	Front & Rear Combined Flow Rate (scfm)
1/26/06	F R	0.0 5.0	0.00 0.05	0 48	0.00 29.51	29.51
2/9/06	F	0.0	0.00	0	0.00	
2/9/00	R	5.0	0.05	47	29.53	29.53
2/23/06	F	0.0	0.00	0	0.00	
2/23/00	R	5.0	0.05	47	29.53	29.53
3/9/06	F	0.0	0.00	0	0.00	
2,3,00	R	5.0	0.12	48	45.71	45.71
3/23/06	F	0.0	0.00	0	0.00	20.20
	R	4.1	0.05	54	29.30	29.30
4/6/06	F	0.0	0.00	0	0.00	51.00
	R	4.0	0.15	47	51.09	51.09
5/4/06	F	0.0	0.00	0	0.00	40.88
	R	4.0	0.10	68	40.88	40.88
5/18/06	F	0.0	0.00	0	0.00	41.29
	R	6.0	0.10	60	41.29	41.27
6/1/06	F	0.0	0.00	0	0.00	40.46
	R	4.8	0.10	80	40.46	40.40
6/15/06	F	0.0	0.00	0	0.00	50.09
	R	6.0	0.15	70	50.09	
6/29/06	F	0.0	0.00	0	0.00	40.90
7/12/06	R	6.0	0.10	70	40.90	
7/13/06	F R	5.0	0.00	0	0.00	0.00
7/27/06	F			0	0.00	
7/27/06	R	7.0	0.00	84	0.00 44.28	44.28
8/24/06	F	0.0	0.12	0	0.00	
6/24/00	R	6.0	0.00	70	40.90	40.90
9/7/06	F	0.0	0.00	0	0.00	
2,1700	R	10.0	0.00	74	50.15	50.15
9/21/06	F	0.0	0.00	0	0.00	
2,21,00	R	10.0	0.10	64	41.34	41.34
10/12/06	F	0.0	0.00	0	0.00	50.02
	R	10.0	0.15	60	50.82	50.82
10/26/06	F	0.0	0.00	0	0.00	50.70
	R	0.0	0.15	48	50.79	50.79
11/9/06	F	0.0	0.00	0	0.00	51.52
	R	10.0	0.15	46	51.52	31.32
12/8/06	F	0.0	0.00	0	0.00	0.00
	R	0.0	0.00	42	0.00	0.00
12/21/06	F	0.0	0.00	0	0.00	62.24
	R	8.0	0.20	0	62.24	02.27

Table E-1

# **Flow Rate Calculations**

Olin Chemical Corporation - Wilmington, MA

Date	Front or Rear	Inlet Pressure (''H2O)	delta Pressure (''H2O)	Temperature °F	System Flow Rate (scfm) <sup>1</sup>	Front & Rear Combined Flow Rate (scfm)
1/4/07	F	0.0	0.00	0	0.00	111.19
	R	10.0	0.70	47	111.19	111.17
1/18/07	F	0.0	0.00	0	0.00	52.46
	R	10.0	0.15	28	52.46	32.40
1/31/07	F	0.0	0.00	0	0.00	42.79
	R	10.0	0.10	29	42.79	42.77
3/15/07	F	0.0	0.00	0	0.00	51.02
	R	6.0	0.15	51	51.02	31.02
3/28/07	F	0.0	0.00	0	0.00	41.71
	R	7.0	0.10	51	41.71	41./1
4/10/07	F	0.0	0.00	0	0.00	51.48
	R	7.0	0.15	43	51.48	31.46
4/27/07	F	0.0	0.00	0	0.00	41.83
	R	7.0	0.10	48	41.83	41.65
5/8/07	F	0.0	0.00	0	0.00	40.97
	R	7.0	0.15	76	49.87	49.87
5/23/07	F	0.0	0.00	0	0.00	50.01
	R	7.0	0.15	73	50.01	50.01
6/8/07	F	0.0	0.00	0	0.00	44.60
	R	7.0	0.12	74	44.69	44.69
6/21/07	F	0.0	0.00	0	0.00	44.44
	R	7.0	0.12	80	44.44	44.44
7/6/07	F	0.0	0.00	0	0.00	44.20
	R	7.0	0.12	86	44.20	44.20
7/19/07	F	0.0	0.00	0	0.00	15.15
	R	6.0	0.13	81	46.16	46.16
8/2/07	F	0.0	0.00	0	0.00	
	R	6.0	0.20	89	56.82	56.82
8/17/07	F	0.0	0.00	0	0.00	44.24
	R	6.0	0.12	82	44.31	44.31
8/30/07	F	0.0	0.00	0	0.00	
	R	6.0	0.24	78	62.89	62.89
9/12/07	F	0.0	0.00	0	0.00	
	R	6.0	0.34	72	75.31	75.31
9/27/07	F	0.0	0.00	0	0.00	
2,21,01	R	6.0	0.24	76	63.01	63.01
10/11/07	F	0.0	0.00	0	0.00	
10/11/07	R	6.5	0.24	58	64.13	64.13

Shaded area represents data for the reporting period.

# Effluent Air Sample Results for SVE/AS System Trailer Olin Chemical Corporation - Wilmington, MA

All compounds presented below are reported in micrograms per cubic meter (ug/ $M^3$ )

Sample Location	Date	2,4,4 Trimethyl-1-Pentene	2,4,4 Trimethyl-2-Pentene	Toluene	m&p Xylenes	Ethylbenzene	Benzene	Acetone	2 - Propanol	1,2,4-Trimethylbenzene	Methylene Chloride	C9-C12 Aliphatic Hydrocarbons	C5-C8 Aliphatic Hydrocarbons	C9-C10 Aromatic Hydrocarbons	Ethanol	Tetrachloroethene	Chloroform
E/VPH Infl.	05/20/05	39	4	2	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
NAPL Infl.	05/20/05	5500	517	6 ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Pre Carbon Effluent	05/20/05 05/20/05	3180 ND	267 ND	ND 11	ND ND	ND ND	ND 2.6	ND NS	ND NS	ND NS	ND NS	NS 248	NS 183	NS ND	ND NS	ND NS	ND NS
E/VPH Infl.	06/14/05	53	6	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
NAPL Infl.	06/14/05	1500	133	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Pre Carbon	06/14/05	1400	130	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	06/14/05	ND	ND	ND	ND	ND	ND	NS	NS	NS	NS	73	33	ND	NS	NS	NS
E/VPH Infl. NAPL Infl.	07/27/05	838 11600	937	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	NS NS	NS NS	NS NS	ND ND	ND ND	ND ND
Pre Carbon	07/27/05	6810	555	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	07/27/05	5	ND	ND	ND	ND	ND	NS	NS	NS	NS	ND	ND	ND	NS	NS	NS
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.	08/29/05	45600	7250	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Pre Carbon	08/29/05	41700	5450	ND	ND	ND	ND	ND	ND	ND	ND	NS 1200	NS 672	NS	ND	ND	ND
Effluent E/VPH Infl.	08/29/05	413 NS	67 NS	ND NS	ND NS	ND NS	ND NS	ND NS	ND NS	ND NS	ND NS	1200 NS	673 NS	ND NS	ND NS	ND NS	ND NS
NAPL Infl.	09/30/05	104,000	9960	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Pre Carbon	09/30/05	117,000	11,300	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	09/30/05	21	3	ND	ND	ND	ND	ND	ND	ND	ND	333	59	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.	12/02/05	NS 4200	NS 207	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon Effluent	12/02/05 12/02/05	4390 ND	387 ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	NS ND	NS ND	NS ND	ND ND	ND ND	ND ND
E/VPH Infl.	12/02/03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	01/06/06	2540	158	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	01/06/06	ND	ND	18.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
E/VPH Infl. NAPL Infl.		NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS
Pre Carbon	02/17/06	947	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	02/17/06	4.45	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.	0.0 (1.0 (0.1	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon Effluent	03/17/06	3760 43.7	276 11	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	NS ND	NS ND	NS ND	ND ND	ND ND	ND ND
E/VPH Infl.	03/17/00	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	04/10/06	>4600	960	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	04/10/06	536	236	3.17	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
E/VPH Infl. NAPL Infl.		NS NS	NS NS	NS NS	NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS	NS	NS	NS	NS NS
Pre Carbon	05/26/06	1370	71.9	ND ND	NS ND	ND	ND	ND	ND ND	ND	ND	NS NS	NS NS	NS NS	NS ND	NS 101	39.3
Effluent	05/26/06	ND	221	ND	ND	ND	ND	ND	ND	ND	50.5	976	3670	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	07/21/06	1620	145	ND	236	40.6	ND	ND	ND	ND	ND	NS 1240	NS	NS 47.2	ND	ND	ND
Effluent E/VPH Infl.	07/21/06	197 NS	65.4 NS	1.62 NS	ND NS	ND NS	ND NS	ND NS	ND NS	ND NS	11.6 NS	1240 NS	281 NS	47.2 NS	ND NS	ND NS	ND NS
NAPL Infl.		NS NS	NS NS	NS NS	NS NS	NS NS	NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS	NS NS	NS	NS NS	NS NS
Pre Carbon	08/18/06	4180	812	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	36.1
Effluent	08/18/06	24.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	668	128	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.	00/15/05	NS	NS 672	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	09/15/06	2780	672	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND

# Effluent Air Sample Results for SVE/AS System Trailer Olin Chemical Corporation - Wilmington, MA

All compounds presented below are reported in micrograms per cubic meter (ug/ $M^3$ )

Sample Location	Date	2,4,4 Trimethyl-1-Pentene	2,4,4 Trimethyl-2-Pentene	Toluene	m&p Xylenes	Ethylbenzene	Benzene	Acetone	2 - Propanol	1,2,4-Trimethylbenzene	Methylene Chloride	C9-C12 Aliphatic Hydrocarbons	C5-C8 Aliphatic Hydrocarbons	C9-C10 Aromatic Hydrocarbons	Ethanol	Tetrachloroethene	Chloroform
Effluent	09/15/06	ND	ND	ND	6.17	ND	ND	ND	ND	ND	38.8	216	75.5	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	10/20/06	18700	1900	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	10/20/06	2.76	ND	ND	ND	ND	ND	ND	ND	ND	9.23	82.1	43	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon				ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.	12/01/05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	12/01/06	1210	28.8	ND	ND	ND	38.1	ND	ND	ND	ND 22.6	NS	NS	NS	ND	ND	ND
Effluent	12/01/06	ND	ND	ND	ND	ND	4.21	ND	ND	ND	22.6	ND	ND	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl. Pre Carbon	01/10/07	NS 2500	NS 294	NS ND	NS ND	NS ND	NS ND	NS ND	NS ND	NS ND	NS ND	NS NS	NS NS	NS NS	NS ND	NS ND	NS ND
Effluent	01/10/07	ND	ND	18.4	5.62	ND	21.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND ND
	01/10/07																
E/VPH Infl. NAPL Infl.		NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS
Pre Carbon	02/28/07	8740	1040	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND ND
Effluent	02/28/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	49.8	ND	ND	ND	ND	ND	ND
E/VPH Infl.	02/20/07	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	03/23/07	2520	409	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	03/23/07	5.32	ND	ND	ND	ND	ND	ND	ND	ND	6.87	ND	ND	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	04/19/07	437	54.1	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	ND	ND
Effluent	04/19/07	ND	ND	ND	ND	ND	ND	ND	ND	3.04	ND	ND	ND	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	05/17/07	207	18.4	ND	ND	ND	ND	ND	ND	ND	ND	NS	NS	NS	ND	3.83	ND
Effluent	05/17/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	13.8	ND	ND	ND	ND	ND	3.06
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	06/26/07	>229	28.9	ND	ND	ND	ND	ND	ND	ND	15	NS	NS	NS	ND	4.01	4.36
Effluent	06/26/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	31.8	ND	ND	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.	0= (2 = (0=	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
Pre Carbon	07/25/07	6490	1030	ND	ND	ND	ND	ND	ND	ND	ND 4.19	NS	NS	NS	ND	ND	ND
Effluent	07/25/07	45.3	10.1	ND	ND	ND	ND	ND	ND	ND	4.18	ND	ND	ND	ND	ND	ND
E/VPH Infl.		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
NAPL Infl.	09/24/07	NS	NS 1730	NS ND	NS ND	NS	NS	NS	NS	NS	NS 4.41	NS	NS NC	NS	NS	NS	NS 3.50
Pre Carbon Effluent	08/24/07	10900	1730 ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	ND ND	4.41 ND	NS ND	NS ND	NS ND	ND ND	ND ND	3.59 ND
	06/24/07																
E/VPH Infl.		NS NS	NS NS	NS NS	NS NS	NS NS	NS	NS	NS	NS	NS	NS	NS NS	NS	NS	NS	NS
NAPL Infl. Pre Carbon	09/26/07	13100	NS 2080	NS ND	NS ND	NS ND	NS ND	NS ND	NS ND	NS ND	NS ND	NS NS	NS NS	NS NS	NS ND	NS ND	NS ND
Effluent	09/26/07	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.12	ND	ND	ND	ND	ND	ND
Littucit	37/20/07	ND	ND	ND	מא	תו	ND	TID	ND	HD	7.12	עוו	ND	ND	ND	ND	111

<sup>\*\* =</sup> First day breakthrough detected.

Samples analyzed using TO-14 and MADEP APH methods.

E = Estimated

#### Table H-1

### Contaminant Mass Removal Summary via AS/SVE

Olin Chemical Corporation - Wilmington, MA

			Field Measurement			Mass	Incremental	Cumulative	Cumulative
		Incremental	of Total VOCs		Flow	Removal	Mass	Mass	System
Date	Time	Operating	as Isobutylene	Conc. [A]	Rate[B]	Rate	Removed	Removed	Run Time
		Hours	(ppmv)	(mg/m3)	(scfm)	(lb/hr)	(lbs)	(lbs)	(days)
12/15/05	11:30 AM	336.8	2	3.6	66.93	0.001	0.30	2221.1	1677.5
12/29/05	9:27 AM	334.0	1	2.1	51.23	0.000	0.14	2221.2	1691.5
01/12/06	10:41 AM	337.2	2	2.7	51.18	0.001	0.17	2221.4	1705.5
01/26/06	10:54 AM	336.2	3	4.5	29.51	0.000	0.17	2221.6	1719.5
02/09/06	1:25 PM	338.5	1	2.5	29.53	0.000	0.09	2221.7	1733.6
02/23/06	10:35 AM	333.2	0	0.0	29.53	0.000	0.00	2221.7	1747.5
03/09/06	10:35 AM	336.0	0	0.0	45.71	0.000	0.00	2221.7	1761.5
03/23/06	10:34 AM	336.0	2	2.9	29.30	0.000	0.11	2221.8	1775.5
04/06/06	10:23 AM	335.8	2	3.8	51.09	0.001	0.24	2222.0	1789.5
05/04/06	2:50 PM	676.5	3	5.4	40.88	0.001	0.55	2222.6	1817.7
05/18/06	9:13 AM	330.4	0	0.0	41.29	0.000	0.00	2222.6	1831.4
06/01/06	11:21 AM	338.1	0	0.0	40.46	0.000	0.00	2222.6	1845.5
6/15/06	11:21 AM	336.0	0.0	0.0	50.09	0.000	0.00	2222.6	1859.5
6/29/06	11:21 AM	336.0	2.7	4.8	40.90	0.001	0.25	2222.8	1873.5
7/13/06	11:21 AM	336.0	0.0	0.0	0.00	0.000	0.00	2222.8	1887.5
7/27/06	11:21 AM	336.0	0.0	0.0	44.28	0.000	0.00	2222.8	1901.5
8/24/06	11:21 AM	672.0	0.0	0.0	40.90	0.000	0.00	2222.8	1929.5
9/7/06	11:21 AM	336.0	3.3	5.9	50.15	0.001	0.37	2223.2	1943.5
9/21/06	11:21 AM	336.0	1.9	3.4	41.34	0.001	0.18	2223.4	1957.5
10/12/06	11:21 AM	504.0	2.5	4.5	50.82	0.001	0.43	2223.8	1978.5
10/26/06	11:21 AM	336.0	4.8	8.6	50.79	0.002	0.55	2224.3	1992.5
11/9/06	11:21 AM	336.0	0.0	0.0	51.52	0.000	0.00	2224.3	2006.5
12/8/06	11:21 AM	696.0	0.0	0.0	0.00	0.000	0.00	2224.3	2035.5
12/21/06	11:21 AM	312.0	1.0	1.8	62.24	0.000	0.13	2224.5	2048.5
1/4/07	11:21 AM	336.0	0.0	0.0	111.19	0.000	0.00	2224.5	2062.5
1/10/07	11:21 AM	144.0	0.2	0.4	40.46	0.000	0.01	2224.5	2068.5
1/18/07	11:21 AM	192.0	0.0	0.0	52.46	0.000	0.00	2224.5	2076.5
1/23/07	11:21 AM	120.0	0.0	0.0	41.42	0.000	0.00	2224.5	2081.5
1/31/07	11:21 AM	192.0	1.2	2.1	42.79	0.000	0.07	2224.5	2089.5
2/5/07	11:21 AM	120.0	2.0	3.6	43.17	0.001	0.07	2224.6	2094.5
2/28/07	11:21 AM	552.0	0.0	0.0	40.46	0.000	0.00	2224.6	2117.5
3/7/07	11:21 AM	168.0	2.0	3.6	45.05	0.001	0.10	2224.7	2124.5
3/15/07	11:21 AM	192.0	3.1	5.5	51.02	0.001	0.20	2224.9	2132.5
3/23/07	11:21 AM	192.0	0.0	0.0	40.46	0.000	0.00	2224.9	2140.5
3/28/07	11:21 AM	120.0	0.0	0.0	41.71	0.000	0.00	2224.9	2145.5
4/10/07	11:21 AM	312.0	0.0	0.0	51.48	0.000	0.00	2224.9	2158.5
4/27/07	11:21 AM	408.0	0.0	0.0	41.83	0.000	0.00	2224.9	2175.5
5/8/07	11:21 AM	264.0	1.1	2.0	49.87	0.000	0.10	2225.0	2186.5
5/23/07	11:21 AM	360.0	0.0	0.0	50.01	0.000	0.00	2225.0	2201.5
6/8/07	11:21 AM	384.0	0.0	0.0	44.69	0.000	0.00	2225.0	2217.5
6/21/07	11:21 AM	312.0	0.0	0.0	44.44	0.000	0.00	2225.0	2230.5
7/6/07	11:21 AM	360.0	0.2	0.4	44.20	0.000	0.02	2225.0	2245.5
7/19/07	11:21 AM	312.0	2.8	5.0	46.16	0.001	0.27	2225.3	2258.5
8/2/07	11:21 AM	336.0	4.4	7.9	56.82	0.002	0.56	2225.9	2272.5
8/17/07	11:21 AM	360.0	7.1	12.7	44.31	0.002	0.76	2226.6	2287.5
8/30/07	11:21 AM	312.0	4.8	8.6	62.89	0.002	0.63	2227.2	2300.5
9/12/07	11:21 AM	312.0	9.0	16.1	75.31	0.005	1.41	2228.7	2313.5
9/27/07	11:21 AM	360.0	2.5	4.5	63.01	0.001	0.38	2229.0	2328.5
10/11/07	11:21 AM	336.0	8.6	15.4	64.13	0.004	1.24	2230.3	2342.5
	Total Time:	54888.7				Total M d During Ren	ass Removed:	2230.3 9.5	

**Total Mass Removed During Reporting Period:** 

9.5

#### **Notes:**

Shaded cells indicate the current reporting period.

ND = Non-detect (less than 0.1 ppmv)

[A] 2,4,4-trimethyl-1-pentene conversion factor (1ppm on PID =1.786 mg/m3) calculated from Air Toxics Lab Data

[B] Flow rate based on field measurements

#### TABLE I-1

# Baseline Groundwater Laboratory Analytical Results Olin Chemical Corp. - Wilmington, MA

Date				Orthopl	hosphate -	P (mg/L)				Orthophosphate - P (mg/L)										
Date	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13	GW-16										
8/1/02	NT	NT	ND	NT	ND	ND	0.1	ND	NT	ND										
4/3/03	ND	10.6	91.0	NT	ND	ND	ND	ND	ND	NT										
5/23/03	NT	113.0	14.2	NT	NT	ND	ND	ND	ND	NT										
9/29/03	NT	160.0	156.0	28.0	307.0	NT	ND	NT	NT	NT										

Date		Ammonia-N (mg/L)											
Date	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13	GW-16			
8/1/02	NT	NT	1.07	NT	4.73	0.29	0.43	0.25	NT	0.92			
4/3/03	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT			
5/23/03	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT			
9/29/03	NT	6.0	2.0	ND	ND	NT	ND	NT	NT	NT			

Date					рН					
Date	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13	GW-16
8/1/02	NT	NT	6.12	NT	6.06	6.03	6.32	3.21	NT	5.86
4/3/03	6.04	6.40	6.02	NT	6.43	5.82	6.44	6.39	5.26	NT
5/23/03	NT	6.59	6.49	NT	NT	5.90	6.47	6.35	5.12	NT
9/29/03	NT	6.24	6.47	6.25	6.07	NT	6.67	NT	NT	NT

Date		BEHP (ug/L)										
Date	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13	GW-16		
4/3/03	ND	29,000	2,800	NT	18,000	ND	1,700	19,000	ND	NT		
5/23/03	NT	21,000	780	NT	NT	84	510	9,600	20	NT		
9/29/03	NT	85,000	1,200	12,000	5,800	NT	1,100	NT	NT	NT		

Date				n	-NDPA (ug	/L)				
Date	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13	GW-16
4/3/03	ND	790	380	NT	2000	ND	ND	ND	ND	NT
5/23/03	NT	1600	740	NT		ND	ND	ND	ND	NT
9/29/03	NT	ND	ND	5200	2900	NT	26	NT	NT	NT

Date		Bicarbonate Alkalinity (mg/L)												
Date	B-5R	-5R P5 IW-1 IW-2 IW-3 GW-102 GW-101 GW-100 GW-13 GW-								GW-16				
8/1/02	NT	NT	41.00	NT	126.00	40.00	85.00	59.00	NT	14.00				

Date				Carbona	ate Alkalini	ty (mg/L)					
Date	B-5R	3-5R P5 IW-1 IW-2 IW-3 GW-102 GW-101 GW-100 GW-13 GW-16									
8/1/02	NT	NT	ND	NT	ND	ND	ND	ND	NT	ND	

Date		Sulfate (mg/L)											
Date	B-5R	5R P5 IW-1 IW-2 IW-3 GW-102 GW-101 GW-100 GW-13 GW-16											
8/1/02	NT	NT	25.40	NT	4.40	18.10	6.30	9.00	NT	39.50			

Date				Nit	trate-N (mg	J/L)				Nitrate-N (mg/L)												
Date	B-5R	B-5R P5 IW-1 IW-2 IW-3 GW-102 GW-101 GW-100 GW-13 GW-16																				
8/1/02	NT	NT	1.71	NT	ND	0.16	ND	ND	NT	10.20												

Date		Nitrite-N (mg/L)												
Date	B-5R	5R   P5   IW-1   IW-2   IW-3   GW-102   GW-101   GW-100   GW-13   GW-16												
8/1/02	NT	NT	ND	NT	ND	ND	ND	0.04	NT	ND				

Date				S	ulfide (mg/	L)					
Date	B-5R	B-5R P5 IW-1 IW-2 IW-3 GW-102 GW-101 GW-100 GW-13 GW-16									
8/1/02	NT	NT	ND	NT	ND	ND	ND	ND	NT	ND	

Date				Total Kje	dahl Nitrog	en (mg/L)						
Date	B-5R	5R P5 IW-1 IW-2 IW-3 GW-102 GW-101 GW-100 GW-13 GW-16										
8/1/02	NT	NT	4.50	NT	7.10	ND	ND	ND	NT	ND		

Note: ND = Not Detected NT = Not Taken

NIS Field Kit Analytical Results Olin Chemical Corp. - Wilmington, MA

D 4	Orthoph	osphate -	P (mg/L)	Nit	rate-N (mg	g/L)	Amn	nonia-N (n	ng/L)
Date	IW-11	IW-12	IW-13	IW-11	IW-12	IW-13	IW-11	IW-12	IW-13
4/12/05	53.3	1.2	10.2	NT	NT	NT	10.0	2.50	32.5
4/19/05	44.7	5.5	14.5	NT	NT	NT	13.0	2.50	30.0
4/26/05	50.0	9.7	8.5	NT	NT	NT	13.0	2.50	32.5
5/3/05	33.0	3.4	5.0	NT	NT	NT	11.0	2.50	35.0
5/11/05	28.6	4.1	5.2	NT	NT	NT	10.0	2.50	27.5
5/24/05	17.0	2.8	2.0	NT	NT	NT	7.0	2.50	23.0
6/2/05	17.0	2.6	2.5	NT	NT	NT	7.5	2.50	17.5
6/7/05	19.7	2.6	2.7	NT	NT	NT	7.5	2.00	2.5
6/13/05	18.2	2.7	2.2	NT	NT	NT	7.5	2.50	25.0
6/20/05	19.2	2.1	2.0	NT	NT	NT	7.5	2.50	25.0
6/28/05	14.0	1.5	2.0	NT	NT	NT	10.7	2.71	25.0
7/7/05	12.2	1.5	1.7	NT	NT	NT NT	10.7	3.70	25.0
7/11/05	10.7	1.0	1.5	NT	NT		6.5	3.00	22.5
7/25/05 8/2/05	9.5	0.5	1.2	NT NT	NT NT	NT NT	4.5 5.0	2.00	20.0
8/10/05	7.7	1.0	1.0	NT	NT	NT	4.0	3.00	20.0
8/29/05	7.7	1.0	1.0	NT	NT	NT	6.0	2.50	20.0
9/12/05	7.0	0.7	0.7	NT	NT	NT	6.0	2.00	21.0
9/12/05	5.5	0.7	0.7	NT	NT	NT	4.0	2.00	20.0
9/26/05	5.5	0.7	0.7	NT	NT	NT	4.0	2.00	20.0
10/3/05	5.0	0.2	0.5	NT	NT	NT	4.0	2.00	20.0
10/12/05	3.2	0.7	1.0	NT	NT	NT	4.5	2.00	20.0
11/15/05	4.2	1.0	0.5	NT	NT	NT	5.0	2.00	25.0
11/22/05	22.0	1.2	0.2	NT	NT	NT	5.0	2.60	14.0
11/28/05	4.0	1.0	0.7	NT	NT	NT	4.0	2.00	20.0
12/6/05	5.7	1.2	0.7	NT	NT	NT	4.0	2.00	30.0
12/13/05	9.0	1.0	0.7	NT	NT	NT	5.0	2.00	25.0
12/21/05	12.2	0.7	1.9	NT	NT	NT	4.4	2.40	13.7
12/27/05	14.5	1.0	1.4	NT	NT	NT	5.5	2.00	30.0
1/3/06	18.0	3.5	3.2	NT	NT	NT	7.0	2.40	29.0
1/9/06	19.7	1.3	0.9	NT	NT	NT	6.0	2.20	35.0
1/17/06	22.5	1.0	0.6	NT	NT	NT	9.0	3.00	25.0
1/23/06	22.5	1.0	0.8	NT	NT	NT	10.0	3.00	30.0
1/30/06	22.5	1.0	0.9	NT	NT	NT	10.0	3.00	25.0
2/8/06	22.5	0.9	0.6	NT	NT	NT	10.0	3.00	25.0
2/13/06	22.5	0.9	0.5	NT	NT	NT	10.0	3.00	25.0
2/21/06	22.5	4.5	0.4	NT	NT	NT	9.0	3.00	20.0
2/28/06	22.5	0.7	0.4	NT	NT	NT	6.0	3.00	20.0
3/6/06	18.7 14.2	0.9	0.4	NT NT	NT NT	NT NT	5.0	2.00 3.00	25.0
3/20/06	9.5	0.7	0.2	NT	NT	NT	5.0	3.00	20.0
4/3/06	1.5	0.6	0.3	NT	NT	NT	4.5	3.00	20.0
4/3/06	9.0	0.7	0.2	NT	NT	NT	4.0	3.00	20.0
4/19/06	6.0	0.7	5.2	NT	NT	NT	4.0	3.00	20.0
4/24/06	7.0	0.7	0.2	NT	NT	NT	4.0	3.00	20.0
5/1/06	7.0	0.8	0.3	NT	NT	NT	4.0	3.00	20.0
5/9/06	6.5	0.8	0.2	NT	NT	NT	4.0	3.00	20.0
5/23/06	10.5	0.9	0.2	NT	NT	NT	4.0	3.00	20.0
5/30/06	9.5	2.0	0.2	NT	NT	NT	4.0	3.00	25.0
6/7/06	8.2	1.9	0.2	NT	NT	NT	4.0	2.00	15.0
6/13/06	7.0	1.8	0.5	NT	NT	NT	5.0	3.00	25.0
6/19/06	7.6	2.5	0.3	NT	NT	NT	4.0	3.50	17.5
6/26/06	8.7	2.5	0.1	NT	NT	NT	4.5	4.00	20.0
7/12/06	4.5	0.9	0.2	NT	NT	NT	5.0	4.00	25.0
7/21/06	4.7	2.4	0.1	NT	NT	NT	5.0	4.00	15.0
7/27/06	4.0	2.6	0.1	NT	NT	NT	4.0	4.00	32.0
8/1/06	3.7	2.0	0.2	NT	NT	NT	5.0	4.00	20.0
8/9/06	3.2	1.8	0.1	NT	NT	NT	6.0	4.00	75.0
8/15/06	3.7	1.7	0.2	NT	NT	NT	5.0	4.00	25.0

NIS Field Kit Analytical Results Olin Chemical Corp. - Wilmington, MA

Date	Orthoph	osphate - l	P (mg/L)	Nit	rate-N (mg	g/L)	Amn	nonia-N (n	ng/L)
Date	IW-11	IW-12	IW-13	IW-11	IW-12	IW-13	IW-11	IW-12	IW-13
8/22/06	3.2	1.5	0.2	NT	NT	NT	5.0	4.00	25.0
8/31/06	3.5	1.3	0.2	NT	NT	NT	4.5	4.00	25.0
9/14/06	2.7	1.0	0.2	NT	NT	NT	4.0	3.00	35.0
9/21/06	2.5	0.9	0.2	NT	NT	NT	4.0	4.00	25.0
9/25/06	3.2	0.9	0.2	NT	NT	NT	4.0	3.00	25.0
10/5/06	2.7	0.9	0.2	NT	NT	NT	4.0	3.00	25.0
10/11/06	3.0	0.9	0.2	NT	NT	NT	4.0	2.00	32.0
10/18/06	3.0	0.9	0.2	NT	NT	NT	4.0	2.60	32.0
10/23/06	3.2	0.9	0.2	NT	NT	NT	4.0	3.00	30.0
10/31/06	3.1	0.9	0.2	NT	NT	NT	4.0	3.00	33.0
11/7/06	3.0	1.0	0.2	NT	NT	NT	4.0	3.00	37.0
11/14/06	3.0	1.0	0.2	NT	NT	NT	4.0	3.00	30.0
11/21/06	3.0	1.0	0.2	NT	NT	NT	4.0	3.00	25.0
11/28/06	2.7	1.1	0.2	NT	NT	NT	4.0	2.20	30.0
12/4/06	2.8	1.0	0.2	NT	NT	NT	4.0	2.20	30.0
12/11/06	3.0	1.0	0.2	NT	NT	NT	4.0	2.20	30.0
12/19/06	2.5	0.9	0.2	NT	NT	NT	5.0	2.00	35.0
12/26/06	2.2	0.8	0.1	NT	NT	NT	4.0	2.00	30.0
1/3/07	2.5	0.9	0.1	NT	NT	NT	4.0	2.60	32.5
1/9/07	0.9	0.8	3.5	NT	NT	NT	4.0	2.20	30.0
1/15/07	4.0	0.7	0.2	NT	NT	NT	4.0	2.20	25.0
1/24/07	2.7	0.7	0.2	NT	NT	NT	4.0	2.20	30.0
2/13/07	2.2	0.5	0.1	NT	NT	NT	4.0	2.00	28.0
2/20/07	1.2	0.6	0.0	NT	NT	NT	4.0	2.20	0.0
2/26/07	3.0	0.7	0.0	NT	NT	NT	4.0	2.00	0.0
3/5/07	3.0	0.7	0.0	NT	NT	NT	4.0	2.00	0.0
3/12/07	8.2	0.7	0.0	NT	NT	NT	5.0	2.00	0.0
3/19/07	1.5	0.5	0.1	NT	NT	NT	4.0	2.20	37.5
3/26/07	2.0	0.6	0.1	NT	NT	NT	4.0	2.00	40.0
4/2/07	2.7	0.6	0.1	NT	NT	NT	4.0	2.00	40.0
4/9/07	2.2	0.5	0.1	NT	NT	NT	4.0	2.00	37.0
4/17/07	4.5	0.6	0.1	NT	NT	NT	4.0	2.00	30.0
4/24/07	2.7	0.7	0.1	NT	NT	NT	4.0	2.00	25.0
5/1/07	2.2	1.3	0.1	NT	NT	NT	4.0	2.00	30.0
5/7/07	2.5	0.6	0.1	NT	NT	NT	4.0	2.00	30.0
5/15/07	2.0	0.6	0.1	NT	NT	NT	4.0	2.50	25.0
5/21/07	1.7	0.6	0.1	NT	NT	NT	4.0	2.40	22.5

### **TABLE I-3**

# NIS Groundwater Laboratory Analytical Results

Olin Chemical Corp. - Wilmington, MA

Date				Orthoph	osphate -	P (mg/L)			
Date	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13
4/3/03	ND	10.6	91.0	NT	ND	ND	ND	ND	ND
5/23/03	NT	113.0	14.2	NT	NT	ND	ND	ND	ND ND NT
9/29/03	NT	160.0	156.0	28.0	307.0	NT	ND	NT	NT

Date				Amı	nonia-N (r	ng/L)			
Date	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13
4/3/03	NT	NT	NT	NT	NT	NT	NT	NT	NT
5/23/03	NT	NT	NT	NT	NT	NT	NT	NT	NT
9/29/03	NT	6.0	2.0	ND	ND	NT	ND	NT	NT

Date	pH								
	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13
4/3/03	6.04	6.40	6.02	NT	6.43	5.82	6.44	6.39	5.26
5/23/03	NT	6.59	6.49	NT	NT	5.90	6.47	6.35	5.26 5.12 NT
9/29/03	NT	6.24	6.47	6.25	6.07	NT	6.67	NT	NT

Date	BEHP (ug/L)									
	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13	
4/3/03	ND	29,000	2,800	NT	18,000	ND	1,700	19,000	ND	
5/23/03	NT	21,000	780	NT		84	510	9,600	ND 20 NT	
9/29/03	NT	85,000	1,200	12,000	5,800	NT	1,100	NT	NT	

Date	n-NDPA (ug/L)								
	B-5R	P5	IW-1	IW-2	IW-3	GW-102	GW-101	GW-100	GW-13
4/3/03	ND	790	380	NT	2000	ND	ND	ND	ND
5/23/03	NT	1600	740	NT		ND	ND	ND	ND
9/29/03	NT	ND	ND	5200	2900	NT	26	NT	NT

Note: ND = Not Detected NT = Not Taken

TABLE J-1

NIS Weekly Injection Volume
Olin Chemical Corp. - Wilmington, MA

Date		Injection Volume (Liters)								Total Weekly Injection	
	IP-1	IP-2	IP-3	IP-4	IP-5	IP-6	IP-7	IT-1	IT-2	IT-3	Volume (Liters)
11/17/04	0.8	200.0	0.8	0.8	0.8	0.8	0.8	150.0	150.0	150.0	655
12/2/04	0.8	200.0	0.8	0.8	0.8	0.8	0.8	150.0	150.0	150.0	655
12/8/04	0.8	200.0	0.8	8.0	0.8	8.0	0.8	150.0	150.0	150.0	655
12/15/04	0.8	200.0	0.8	8.0	0.8	8.0	0.8	150.0	150.0	150.0	655
12/22/04	0.8	200.0	0.8	8.0	0.8	8.0	0.8	150.0	150.0	150.0	655
12/28/04	0.8	200.0	0.8	0.8	0.8	8.0	0.8	150.0	150.0	150.0	655
1/4/05	0.8	200.0	0.8	0.8	0.8	8.0	0.8	150.0	150.0	150.0	655
1/19/05	0.8	350.0	0.8	0.8	0.8	8.0	0.8	150.0	NA	150.0	655
1/26/05	0.8	200.0	0.8	0.8	0.8	0.8	0.8	200.0	200.0	200.0	800
2/1/05	0.8	200.0	8.0	8.0	0.8	0.8	8.0	200.0	200.0	200.0	800
2/8/05	0.8	200.0	0.8	8.0	8.0	0.8	0.8	200.0	200.0	200.0	800
2/15/05	0.8	200.0	8.0	8.0	0.8	0.8	8.0	200.0	200.0	200.0	800
2/23/05	8.0	200.0	8.0	8.0	8.0	0.8	0.8	200.0	200.0	200.0	800
6/14/05	0.0	0.0	0.0	0.0	0.0	0.0	0.0	200.0	0.0	150.0	350
11/15/05	0.0	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
11/22/05	0.0	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
11/29/05	0.0	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
12/6/05	0.0	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
12/13/05	0.0	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
12/21/05	0.0	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
12/27/05	<1	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
1/3/06	<1	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
1/10/06	<1	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650
1/17/06	<1	200.0	<1	<1	<1	<1	<1	150.0	150.0	150.0	650

TABLE J-2

#### NIS Pre- and Post-Injection Groundwater Monitoring

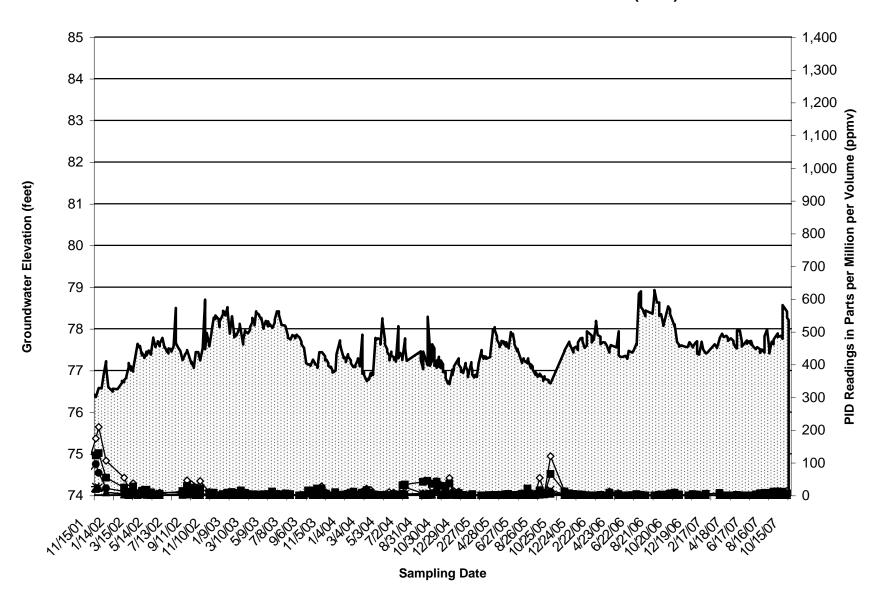
Olin Chemical Corp. - Wilmington, MA

9/17/04 9/23/04	Pre Inj.	DTP (ft.)	DTW (ft.)	DTP (ft.)	DTM (ft )					(2. )	
9/23/04	Pre Inj.			DIF (IL.)	DTW (ft.)	DTP (ft.)	DTW (ft.)	DTP (ft.)	DTW (ft.)	DTP (ft.)	DTW (ft.)
		NT	NT	-	13.04	-	12.94	-	13.08	NT	NT
	Post Inj	NT	NT	-	13.1	-	13.3	-	13.21	NT	NT
0/00/04	Pre Inj.	NT	NT	-	12.97		13.11	-	12.8	NT	NT
	Post Inj	NT	NT	-	13.02	Trace	13.25	-	12.97	NT	NT
9/29/04	Pre Inj.	NT	NT	-	12.88	-	12.77	-	12.78	NT	NT
10/7/01	Post Inj	NT	NT	-	12.95	-	13.02	-	12.93	NT	NT
10/7/04	Pre Inj.	NT	NT	-	12.98	-	12.57	-	12.85	NT	NT
10/14/04	Post Inj	NT NT	NT NT	-	13.04 13.22	-	12.97 13.32	-	12.97 13.21	NT NT	NT NT
10/14/04	Pre Inj. Post Inj	NT	NT	-	13.22	-	13.32	-	13.21	NT	NT
10/21/04	Pre Inj.	NT	NT		13.10		12.85	-	13.17	NT	NT
10/21/04	Post Inj	NT	NT	_	13.14	_	13.03	_	13.11	NT	NT
10/27/04	Pre Inj.	NT	NT	-	13.25	-	13.33	-	13.18	NT	NT
	Post Inj	NT	NT	-	13.27	-	13.36	-	13.2	NT	NT
11/3/04	Pre Inj.	NT	NT	-	13.39	-	13.47	-	13.31	NT	NT
	Post Inj	NT	NT	-	13.37	-	13.37	-	13.28	NT	NT
11/10/04	Pre Inj.	NT	NT	-	13.61	-	13.57	-	13.61	NT	NT
	Post Inj	NT	NT	-	13.62	-	13.58	-	13.62	NT	NT
11/17/04	Pre Inj.	NT	NT	-	13.62	-	13.41	-	13.68	NT	NT
	Post Inj	NT	NT	-	13.63	-	13.45	-	13.68	NT	NT
12/2/04	Pre Inj.	NT	NT	-	13.56	0	13.45	-	13.49	NT	NT
10/0/01	Post Inj	NT	NT	-	13.57	0	13.43	-	13.51	NT	NT
12/8/04	Pre Inj.	NT	NT	-	13.35	0	13.29	-	13.33	NT	NT
12/15/04	Post Inj	NT NT	NT NT	-	13.35 13.21	0	13.24 13.07	-	13.26 13.08	NT NT	NT NT
12/15/04	Pre Inj. Post Inj	NT	NT NT	-	13.21	0	13.07	-	12.98	NT	NT
12/22/04	Pre Inj.	NT	NT	-	13.19	0	13.03	-	13.18	NT	NT
12/22/04	Post Inj	NT	NT	-	13.36	0	13.28	_	13.16	NT	NT
12/28/04	Pre Inj.	NT	NT	_	13.38	0	13.24	_	13.32	NT	NT
12/20/01	Post Inj	NT	NT	_	13.38	0	13.24	_	13.35	NT	NT
1/4/05	Pre Inj.	NT	NT	-	13.39	0	13.35	-	13.31	NT	NT
	Post Inj	NT	NT	-	13.41	0	13.35	_	13.32	NT	NT
1/19/05	Pre Inj.	NT	NT	-	12.99	0	12.98	-	12.98	NT	NT
	Post Inj	NT	NT	-	12.99	0	12.79	-	12.98	NT	NT
1/26/05	Pre Inj.	NT	NT	-	13.15	0	13.17	-	13.21	NT	NT
	Post Inj	NT	NT	-	13.12	0	13.17	-	13.21	NT	NT
2/1/05	Pre Inj.	NT	NT	-	13.45	0	13.36	-	13.53	NT	NT
	Post Inj	NT	NT	-	13.43	0	13.35	-	13.5	NT	NT
2/8/05	Pre Inj.	NT	NT	-	13.52	0	13.52	-	13.66	NT	NT
0/45/05	Post Inj	NT	NT	-	13.52	0	13.52	-	13.66	NT	NT
2/15/05	Pre Inj.	NT	NT	-	13.28	13.28	13.29	-	13.36	NT	NT
2/22/05	Post Inj	NT NT	NT NT	-	13.29	trace 12.77	13.29 12.78	-	13.35 12.77	NT NT	NT NT
2/23/05	Pre Inj. Post Inj	NT NT	NT NT	-	12.80 12.85	12.77	12.78 12.79	_	12.77	NT NT	NT NT
6/14/05	Post inj Pre Inj.	NT	NT	NT	NT	12.78 NT	12.79 NT	- NT	NT	NT	NT
J/ 1 <del>1/</del> /UJ	Post Inj.	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
11/15/05	Pre Inj.	NT	NT	NT	13.07	Trace	13.03	Trace	13.16	NT	NT
, . 5, 50	Post Inj	NT	NT	NT	13.10	Trace	13.08	Trace	13.16	NT	NT
11/22/05	Pre Inj.	NT	NT	NT	12.77	NT	12.88	NT	13.04	NT	NT
	Post Inj	NT	NT	NT	12.79	NT	12.88	NT	13.04	NT	NT
12/6/05	Pre Inj.	NT	NT	NT	12.71	NT	12.66	Sheen	12.81	NT	NT
	Post Inj	NT	NT	NT	12.67	NT	12.65	Sheen	12.82	NT	NT
12/13/05	Pre Inj.	NT	NT	NT	12.84	NT	12.9	NT	13.02	NT	NT
	Post Inj	NT	NT	NT	12.86	NT	12.91	NT	13.02	NT	NT
12/21/05	Pre Inj.	NT	NT	NT	12.74	NT	12.7	Trace	12.92	NT	NT
	Post Inj	NT	NT	NT	12.75	NT	12.8	Trace	12.93	NT	NT
12/27/05	Pre Inj.	NT	NT	NT	12.61	NT	12.68	NT	12.81	NT	NT
1101-	Post Inj	NT	NT NT	NT	12.64	NT	12.68	NT	12.81	NT	NT
1/3/06	Pre Inj.	NT	NT	NT	12.51	NT	12.53	NT	12.51	NT	NT
4/40/00	Post Inj	NT	NT	NT	12.54	NT	12.53	NT	12.53	NT	NT
1/10/06	Pre Inj.	NT	NT	NT	12.79	NT	12.78	NT	12.83	NT	NT
1/17/06	Post Inj Pre Inj.	NT NT	NT NT	NT NT	12.73	NT	12.75	NT	12.6	NT	NT
1/17/06	Pre inj. Post Inj	NT NT	NT NT	NT NT	12.51 12.53	NT NT	12.51 12.5	NT NT	12.54 12.43	NT NT	NT NT

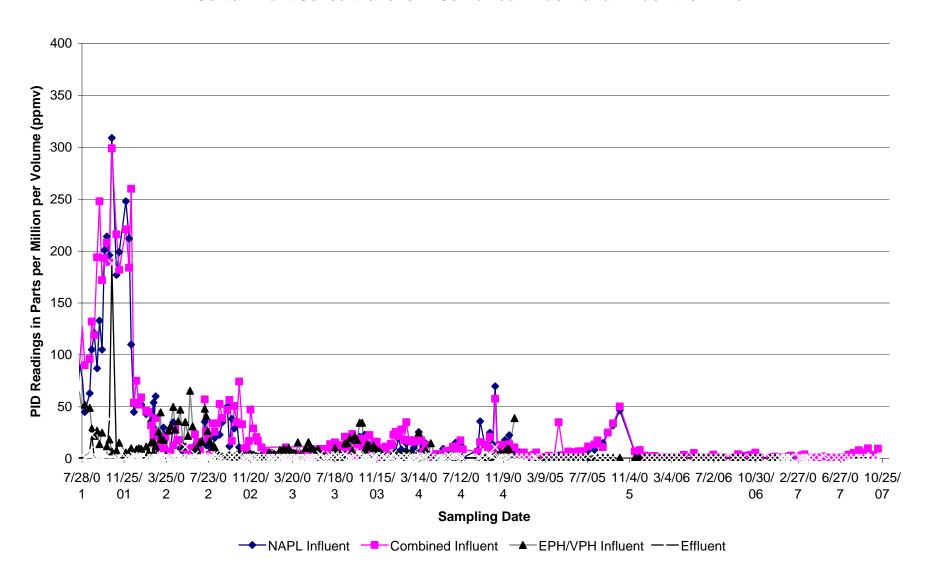
Notes: DTP = Depth to Product DTW = Depth to Water NT = Not Taken

Measurements taken from top of PVC or casing.

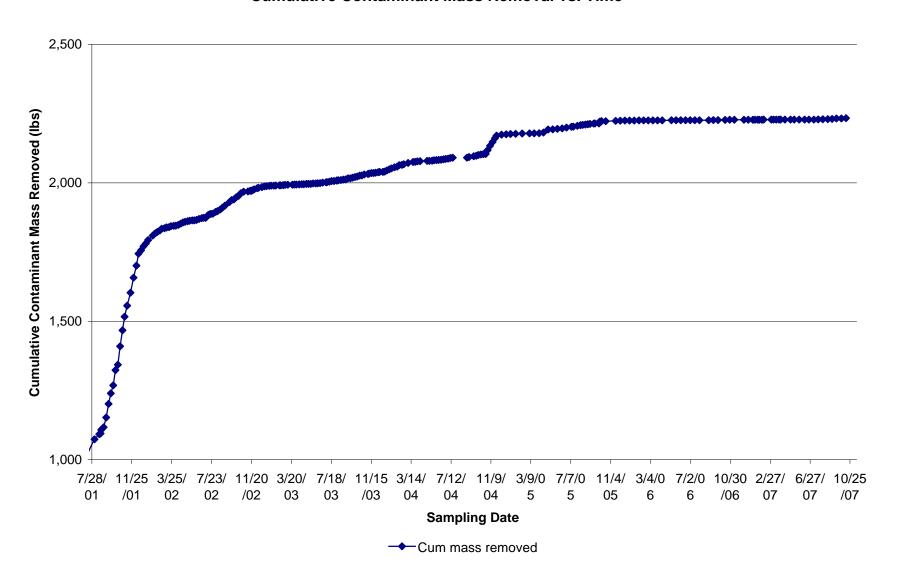
Graph G-10
Groundwater Elevations and Contaminant Concentrations in NAPL (MPE) Area vs. Time

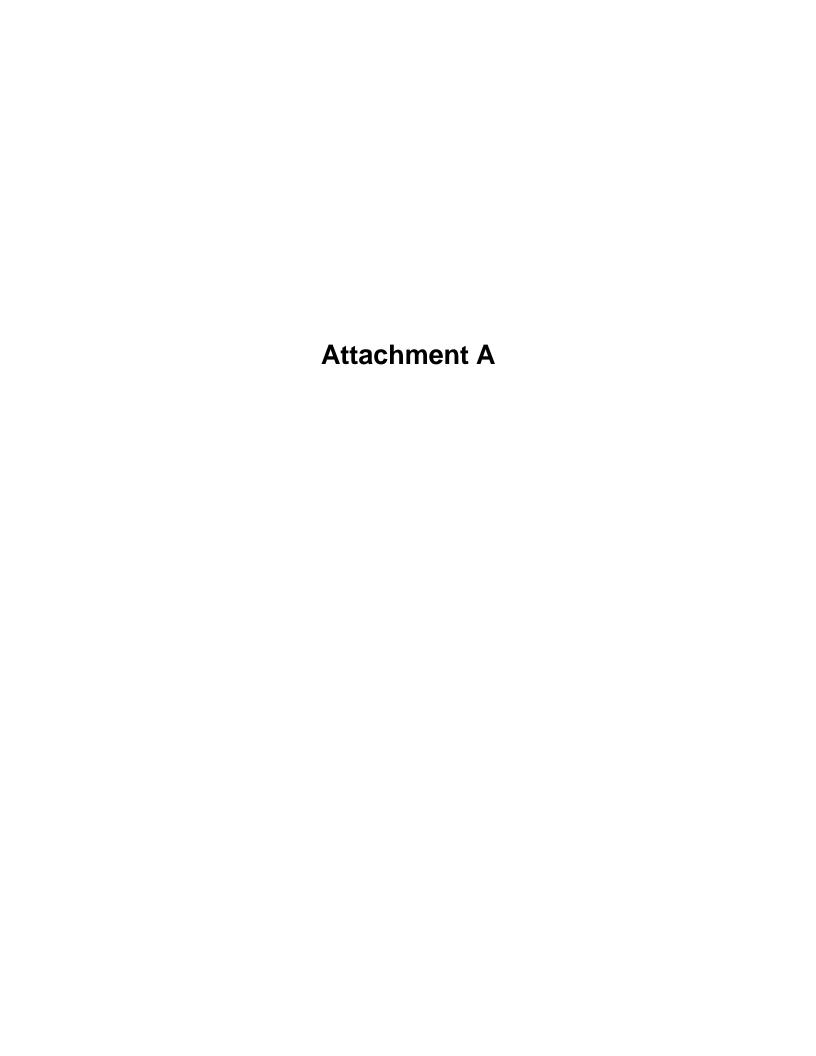


Graph G-11
Contaminant Concentrations in Combined Influent and Effluent vs. Time



Graph G-12
Cumulative Contaminant Mass Removal vs. Time





#### ALPHA ANALYTICAL LABORATORIES

#### Eight Walkup Drive Westborough, Massachusetts 01581-1019 (508) 898-9220 www.alphalab.com

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

#### CERTIFICATE OF ANALYSIS

Client: Shaw E&I Laboratory Job Number: L0514748

Address: 100 Technology Center Drive

Stoughton, MA 02072 Date Received: 05-DEC-2005

Attn: Mr David Cobb Date Reported: 12-DEC-2005

Project Number: 681076 Delivery Method: Alpha

Site: OLIN

ALPHA SAMPLE NUMBER CLIENT IDENTIFICATION SAMPLE LOCATION WILMINGTON, MA L0514748-01 PRE-CARBON L0514748-02 EFFLUENT WILMINGTON, MA L0514748-03 UNUSED CAN 1 WILMINGTON, MA L0514748-04 UNUSED CAN 2 WILMINGTON, MA

Authorized by: Dong on Greelay

Technical Director

12120515:31 Page 1 of 19

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

## ALPHA ANALYTICAL LABORATORIES NARRATIVE REPORT

Laboratory Job Number: L0514748

TO-14

L0514748-01 has elevated limits of detection due to the 10x dilutions required by the elevated concentrations of target compounds in the sample.

APH

The WG223207-2 LCS % recovery for 1,3-butadiene is below the individual acceptance criteria for the compound, but within the overall method allowances.

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0514748-01 Date Collected: 02-DEC-2005 10:30

PRE-CARBON Date Received: 05-DEC-2005
AIR Date Reported: 12-DEC-2005

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

Sample Matrix:

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	ANAL	ID
Volatile Organic Compounds	in Air - ug/	m3		48 TO-14A		1206 22:2	1 AR
1,1,1-Trichloroethane	ND	ug/m3	68.1				
1,1,2,2-Tetrachloroethane	ND	ug/m3	85.7				
1,1,2-Trichloroethane	ND	ug/m3	68.1				
1,1-Dichloroethane	ND	ug/m3	50.6				
1,1-Dichloroethene	ND	ug/m3	49.5				
1,2,4-Trichlorobenzene	ND	ug/m3	92.7				
1,2,4-Trimethylbenzene	ND	ug/m3	61.4				
1,2-Dibromoethane	ND	ug/m3	96.0				
1,2-Dichlorobenzene	ND	ug/m3	75.1				
1,2-Dichloroethane	ND	ug/m3	50.6				
1,2-Dichloropropane	ND	ug/m3	57.7				
1,3,5-Trimethylbenzene	ND	ug/m3	61.4				
1,3-Dichlorobenzene	ND	ug/m3	75.1				
1,4-Dichlorobenzene	ND	ug/m3	75.1				
Benzene	ND	ug/m3	39.9				
Benzyl chloride	ND	ug/m3	64.7				
Bromomethane	ND	ug/m3	48.5				
Carbon tetrachloride	ND	ug/m3	78.6				
Chlorobenzene	ND	ug/m3	57.5				
Chloroethane	ND	ug/m3	33.0				
Chloroform	ND	ug/m3	61.0				
Chloromethane	ND	ug/m3	25.8				
cis-1,2-Dichloroethene	ND	ug/m3	49.5				
cis-1,3-Dichloropropene	ND	ug/m3	56.7				
Dichlorodifluoromethane	ND	ug/m3	124.				
Ethylbenzene	ND	ug/m3	54.2				
1,1,2-Trichloro-1,2,2-Trifl	uor	3.					
oethane	ND	ug/m3	95.7				
1,2-Dichloro-1,1,2,2-tetraf	luo	3.					
roethane	ND	ug/m3	87.3				
Hexachlorobutadiene	ND	ug/m3	133.				
Methylene chloride	ND	ug/m3	86.8				
p/m-Xylene	ND	ug/m3	108.				
o-Xylene	ND	ug/m3	54.2				
Styrene	ND	ug/m3	53.2				
Tetrachloroethene	ND	ug/m3	84.7				
Toluene	ND	ug/m3	47.1				
trans-1,2-Dichloroethene	ND	ug/m3	49.5				

Comments: Complete list of References and Glossary of Terms found in Addendum I

Laboratory Sample Number: L0514748-01

PRE-CARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	TE ANAL	ID
Volatile Organic Compounds i	n Air - ug/	m3 cont'd		48 TO-14A		1206 22:2	21 AR
trans-1,3-Dichloropropene	ND	ug/m3	56.7				
Trichloroethene	ND	ug/m3	67.1				
Trichlorofluoromethane	ND	ug/m3	70.2				
Vinyl chloride	ND	ug/m3	31.9				
2,4,4-Trimethyl-2-Pentene	387.	ug/m3	57.3				
2,4,4-Trimethyl-1-Pentene	4390	ug/m3	57.3				
Volatile Organic Compounds i	n Air - ppb	V		48 TO-14A		1206 22:2	21 AR
1,1,1-Trichloroethane	ND	Vdqq	12.5				
1,1,2,2-Tetrachloroethane	ND	Vdqq	12.5				
1,1,2-Trichloroethane	ND	Vdqq	12.5				
1,1-Dichloroethane	ND	Vdqq	12.5				
1,1-Dichloroethene	ND	Vdqq	12.5				
1,2,4-Trichlorobenzene	ND	ppbV	12.5				
1,2,4-Trimethylbenzene	ND	ppbV	12.5				
1,2-Dibromoethane	ND	ppbV	12.5				
1,2-Dichlorobenzene	ND	ppbV	12.5				
1,2-Dichloroethane	ND	ppbV	12.5				
1,2-Dichloropropane	ND	ppbV	12.5				
1,3,5-Trimethylbenzene	ND	ppbV	12.5				
1,3-Dichlorobenzene	ND	ppbV	12.5				
1,4-Dichlorobenzene	ND	ppbV	12.5				
Benzene	ND	ppbV	12.5				
Benzyl chloride	ND	ppbV	12.5				
Bromomethane	ND	ppbV	12.5				
Carbon tetrachloride	ND	ppbV	12.5				
Chlorobenzene	ND	ppbV	12.5				
Chloroethane	ND	ppbV	12.5				
Chloroform	ND	ppbV	12.5				
Chloromethane	ND	ppbV	12.5				
cis-1,2-Dichloroethene	ND	ppbV	12.5				
cis-1,3-Dichloropropene	ND	ppbV	12.5				
Dichlorodifluoromethane	ND	Vdqq	25.0				
Ethylbenzene	ND	ppbV	12.5				
1,1,2-Trichloro-1,2,2-Triflu		PP					
oethane	ND	ppbV	12.5				
1,2-Dichloro-1,1,2,2-tetrafl		FF~·					
roethane	ND	Vdqq	12.5				
Hexachlorobutadiene	ND	ppbV	12.5				
Methylene chloride	ND	ppbV	25.0				
p/m-Xylene	ND	ppbv	25.0				
o-Xylene	ND	ppbv	12.5				
Styrene	ND	ppbv	12.5				
Tetrachloroethene	ND	ppbv ppbV	12.5				
Toluene	ND	yddd	12.5				
trans-1,2-Dichloroethene	ND ND	Vdqq	12.5				
trans-1,3-Dichloropropene	ND	ppbV	12.5				
Trichloroethene	ND	ppbV	12.5				
Trichlorofluoromethane	ND	ppbV	12.5				

Laboratory Sample Number: L0514748-01

PRE-CARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds	in Air - ppbV	cont'd		48 TO-14A	1206 22:21 AR
Vinyl chloride	ND	ydqq	12.5		
2,4,4-Trimethyl-2-Pentene	84.3	Vdqq	12.5		
2,4,4-Trimethyl-1-Pentene	958.	ppbV	12.5		

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0514748-02 Date Collected: 02-DEC-2005 10:45

Sample Matrix: Date Received: 05-DEC-2005
Date Reported: 12-DEC-2005

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	ANAL	ID
Volatile Organic Compounds	in Air - ug/	m 3		48 TO-14A		1206 21:	10 AD
1,1,1-Trichloroethane	ND ND	ug/m3	2.72	40 10 14A		1200 21.	10 AIC
1,1,2,2-Tetrachloroethane	ND	ug/m3	3.43				
1,1,2-Trichloroethane	ND	ug/m3	2.72				
1,1-Dichloroethane	ND	ug/m3	2.02				
1,1-Dichloroethene	ND	ug/m3	1.98				
1,2,4-Trichlorobenzene	ND	ug/m3	3.71				
1,2,4-Trimethylbenzene	ND	ug/m3	2.46				
1,2-Dibromoethane	ND	ug/m3	3.84				
1,2-Dichlorobenzene	ND	ug/m3	3.00				
1,2-Dichloroethane	ND	ug/m3	2.02				
1,2-Dichloropropane	ND	ug/m3	2.31				
1,3,5-Trimethylbenzene	ND	ug/m3	2.46				
1,3-Dichlorobenzene	ND	ug/m3	3.00				
1,4-Dichlorobenzene	ND	ug/m3	3.00				
Benzene	ND	ug/m3	1.60				
Benzyl chloride	ND	ug/m3	2.59				
Bromomethane	ND	ug/m3	1.94				
Carbon tetrachloride	ND	ug/m3	3.14				
Chlorobenzene	ND	ug/m3	2.30				
Chloroethane	ND	ug/m3	1.32				
Chloroform	ND	ug/m3	2.44				
Chloromethane	ND	ug/m3	1.03				
cis-1,2-Dichloroethene	ND	ug/m3	1.98				
cis-1,3-Dichloropropene	ND	ug/m3	2.27				
Dichlorodifluoromethane	ND	ug/m3	4.94				
Ethylbenzene	ND	ug/m3	2.17				
1,1,2-Trichloro-1,2,2-Trifl	uor						
oethane	ND	ug/m3	3.83				
1,2-Dichloro-1,1,2,2-tetraf	luo						
roethane	ND	ug/m3	3.49				
Hexachlorobutadiene	ND	ug/m3	5.33				
Methylene chloride	ND	ug/m3	3.47				
p/m-Xylene	ND	ug/m3	4.34				
o-Xylene	ND	ug/m3	2.17				
Styrene	ND	ug/m3	2.13				
Tetrachloroethene	ND	ug/m3	3.39				
Toluene	ND	ug/m3	1.88				
trans-1,2-Dichloroethene	ND	ug/m3	1.98				

Laboratory Sample Number: L0514748-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	TE ANAL	ID
Volatile Organic Compounds	in Air - ug/	m3 cont'd		48 TO-14A		1206 21:4	8 AR
rans-1,3-Dichloropropene	ND	ug/m3	2.27				
Trichloroethene	ND	ug/m3	2.68				
Crichlorofluoromethane	ND	ug/m3	2.81				
inyl chloride	ND	ug/m3	1.28				
,4,4-Trimethyl-2-Pentene	ND	ug/m3	2.29				
,4,4-Trimethyl-1-Pentene	ND	ug/m3	2.29				
olatile Organic Compounds i	in Air - ppb	νV		48 TO-14A		1206 21:4	8 AR
,1,1-Trichloroethane	ND	ppbV	0.500				
.,1,2,2-Tetrachloroethane	ND	ppbV	0.500				
.,1,2-Trichloroethane	ND	ppbV	0.500				
.,1-Dichloroethane	ND	ppbV	0.500				
,1-Dichloroethene	ND	ppbV	0.500				
,2,4-Trichlorobenzene	ND	ppbV	0.500				
,2,4-Trimethylbenzene	ND	ppbV	0.500				
,2-Dibromoethane	ND	ppbV	0.500				
,2-Dichlorobenzene	ND	ppbV	0.500				
,2-Dichloroethane	ND	ppbV	0.500				
,2-Dichloropropane	ND	Vdqq	0.500				
,3,5-Trimethylbenzene	ND	Vdqq	0.500				
,3-Dichlorobenzene	ND	ppbV	0.500				
,4-Dichlorobenzene	ND	ppbV	0.500				
enzene	ND	ppbV	0.500				
enzyl chloride	ND	ppbV	0.500				
romomethane	ND	ppbV	0.500				
arbon tetrachloride	ND	ppbV	0.500				
hlorobenzene	ND	ppbV	0.500				
thloroethane	ND	ppbV	0.500				
hloroform	ND	ppbV	0.500				
hloromethane	ND	Vdqq	0.500				
is-1,2-Dichloroethene	ND	ppbV	0.500				
is-1,3-Dichloropropene	ND	ppbV	0.500				
ichlorodifluoromethane	ND	ppbV	1.00				
thylbenzene	ND	ppbv	0.500				
,1,2-Trichloro-1,2,2-Triflu		PPDV	0.500				
ethane	ND	Vdqq	0.500				
,2-Dichloro-1,1,2,2-tetraf		PPD A	0.500				
oethane	ND	nnhī/	0.500				
exachlorobutadiene	ND ND	ppbV ppbV	0.500				
ethylene chloride							
	ND ND	ppbV	1.00				
/m-Xylene		ppbV	1.00				
-Xylene	ND	ppbV	0.500				
tyrene	ND	Vdqq	0.500				
etrachloroethene	ND	ppbV	0.500				
oluene	ND	ppbV	0.500				
rans-1,2-Dichloroethene	ND	ppbV	0.500				
rans-1,3-Dichloropropene	ND	ppbV	0.500				
richloroethene	ND	ppbV	0.500				
richlorofluoromethane	ND	Vdqq	0.500				

Laboratory Sample Number: L0514748-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE II PREP ANAL
Volatile Organic Compounds	in Air - ppbV	cont'd		48 TO-14A	1206 21:48 A
Vinyl chloride 2,4,4-Trimethyl-2-Pentene 2,4,4-Trimethyl-1-Pentene	ND ND ND	ppbV ppbV ppbV	0.500 0.500 0.500		

 $\hbox{{\tt Comments:}} \ \hbox{{\tt Complete list of References and Glossary of Terms found in Addendum I} \\$ 

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Laboratory Sample Number: L0514748-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE	ID
					PREP ANAL	
Petroleum Hydrocarbons in Air	î			43 DRAFT 1	1206 21:48	в вт
Qua	ality Conti	rol Informa	ation			
Sample Type:	Grab					
Sample Container Type:	Canis	ster				
Sampling Flow Controller:	Mecha	anical				
Sampling Zone:	Unkno	own				
Sampling Flow Meter RPD o	of pre & po	ost-samplir	ng calib	ration check: <	=10%	
Were all QA/QC procedures REQ	QUIRED by t	the method	followed	d?	YI	ES
Were all performance/acceptar	nce standaı	rds for the	e requir	ed procedures a	chieved? No	)
1. One or more of the APH						
Were significant modification	ns made to	the method	d as spe	cified in Sect	11.3? NO	)
C5-C8 Aliphatics	ND	ug/m3	24.0			
C9-C12 Aliphatics	ND ND	ug/m3	24.0			
1,3-Butadiene	ND	ug/m3	2.00			
Methyl tert butyl ether	ND	ug/m3				
_			2.00			
Benzene	ND	ug/m3	2.00 2.00			
	ND ND	ug/m3 ug/m3				
Toluene		_	2.00			
Toluene Ethylbenzene	ND	ug/m3	2.00			
Toluene Ethylbenzene p/m-Xylene	ND ND	ug/m3 ug/m3	2.00 2.00 2.00			
Toluene Ethylbenzene p/m-Xylene o-Xylene	ND ND ND	ug/m3 ug/m3 ug/m3	2.00 2.00 2.00 4.00			
Benzene Toluene Ethylbenzene p/m-Xylene o-Xylene Naphthalene 2-Methylnaphthalene	ND ND ND ND	ug/m3 ug/m3 ug/m3 ug/m3	2.00 2.00 2.00 4.00 2.00			
Toluene Ethylbenzene p/m-Xylene o-Xylene Naphthalene	ND ND ND ND ND	ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	2.00 2.00 2.00 4.00 2.00 2.00			
Toluene Ethylbenzene p/m-Xylene o-Xylene Naphthalene 2-Methylnaphthalene	ND ND ND ND ND ND ND	ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	2.00 2.00 2.00 4.00 2.00 2.00 8.00			

MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0514748-03

L0514748-03 Date Collected: UNUSED CAN 1 Date Received:

Sample Matrix: AIR

Date Received : 05-DEC-2005
Date Reported : 12-DEC-2005

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers:

PARAMETER RESULT UNITS RDL REF METHOD DATE ID
PREP ANAL

Comments: Complete list of References and Glossary of Terms found in Addendum I

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MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0514748-04

L0514748-04 Date Collected:
UNUSED CAN 2 Date Received: 05-DEC-2005

Date Reported : 12-DEC-2005

Sample Matrix: AIR

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers:

PARAMETER RESULT UNITS RDL REF METHOD DATE ID
PREP ANAL

Comments: Complete list of References and Glossary of Terms found in Addendum I

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# ALPHA ANALYTICAL LABORATORIES QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0514748

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
				0 /- 051 445	
Volatile Organic Comp					
1,1,1-Trichloroethane	ND	ND	ug/m3	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ug/m3	NC	25
1,1,2-Trichloroethane	ND	ND	ug/m3	NC	25
1,1-Dichloroethane	ND	ND	ug/m3	NC	25
1,1-Dichloroethene	ND	ND	ug/m3	NC	25
1,2,4-Trichlorobenzene	ND	ND	ug/m3	NC	25
1,2,4-Trimethylbenzene	33.0	32.7	ug/m3	1	25
1,2-Dibromoethane	ND	ND	ug/m3	NC	25
1,2-Dichlorobenzene	ND	ND	ug/m3	NC	25
1,2-Dichloroethane	ND	ND	ug/m3	NC	25
1,2-Dichloropropane	ND	ND	ug/m3	NC	25
1,3,5-Trimethylbenzene	30.1	26.2	ug/m3	14	25
1,3-Dichlorobenzene	ND	ND	ug/m3	NC	25
1,4-Dichlorobenzene	ND	ND	ug/m3	NC	25
Benzene	14.0	13.6	ug/m3	3	25
Benzyl chloride	ND	ND	ug/m3	NC	25
Bromomethane	ND	ND	ug/m3	NC	25
Carbon tetrachloride	ND	ND	ug/m3	NC	25
Chlorobenzene	ND	ND	ug/m3	NC	25
Chloroethane	ND	ND	ug/m3	NC	25
Chloroform	ND	ND	ug/m3	NC	25
Chloromethane	ND	ND	ug/m3	NC	25
cis-1,2-Dichloroethene	ND	ND	ug/m3	NC	25
cis-1,3-Dichloropropene	ND	ND	ug/m3	NC	25
Dichlorodifluoromethane	ND	ND	ug/m3	NC	25
Ethylbenzene	21.9	22.0	ug/m3	0	25
1,1,2-Trichloro-1,2,2-Trifluo					
oethane	ND	ND	ug/m3	NC	25
1,2-Dichloro-1,1,2,2-tetraflu					
roethane	ND	ND	ug/m3	NC	25
Hexachlorobutadiene	ND	ND	ug/m3	NC	25
Methylene chloride	ND	ND	ug/m3	NC	25
p/m-Xylene	73.7	73.4	ug/m3	0	25
o-Xylene	25.5	25.6	ug/m3	0	25
Styrene	ND	ND	ug/m3	NC	25
Tetrachloroethene	239.	233.	ug/m3	3	25
Toluene	445.	428.	ug/m3	4	25
trans-1,2-Dichloroethene	ND	ND	ug/m3	NC	25
trans-1,3-Dichloropropene	ND	ND	ug/m3	NC	25
Trichloroethene	ND	ND	ug/m3	NC	25
Trichlorofluoromethane	ND	ND	ug/m3	NC	25
Vinyl chloride	ND	ND	ug/m3	NC	25
Petroleum Hydroca	rbons in Air	for sampl	e(s) 02 (	L0514433-0	)2, WG223207-1)
C5-C8 Aliphatics	6750	6380	ug/m3	6	30
C9-C12 Aliphatics	1880	1840	ug/m3	2	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	121.	120.	ug/m3	1	30

# ALPHA ANALYTICAL LABORATORIES QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0514748

Continued

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Petroleum Hydroca	rbons in Air	for sample	e(s) 02	(L0514433-02	2, WG223207-1)
Benzene	14.2	13.8	ug/m3	3	30
Toluene	418.	391.	ug/m3	7	30
Ethylbenzene	20.2	20.4	ug/m3	1	30
p/m-Xylene	67.4	67.5	ug/m3	0	30
o-Xylene	22.0	22.2	ug/m3	1	30
Naphthalene	26.0	26.0	ug/m3	0	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	6080	5750	ug/m3	6	30
C9-C12 Aliphatics, Adjusted	409.	388.	ug/m3	5	30
C9-C10 Aromatics	1440	1430	ug/m3	1	30

# ALPHA ANALYTICAL LABORATORIES QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0514748

Parameter	% Recovery	QC Criteria
Volatile Organic Compounds in Air	ICS for sample	a) 01-02 (MC222025-2)
1,1,1-Trichloroethane	87	70-130
1,1,2,2-Tetrachloroethane	99	70-130
1,1,2-Trichloroethane	87	70-130
1,1-Dichloroethane	93	70-130
	78	70-130
1,1-Dichloroethene		
1,2,4-Trichlorobenzene	77 102	70-130
1,2,4-Trimethylbenzene		70-130
1,2-Dibromoethane	89	70-130
1,2-Dichlorobenzene	99	70-130
1,2-Dichloroethane	78	70-130
1,2-Dichloropropane	88	70-130
1,3,5-Trimethylbenzene	124	70-130
1,3-Dichlorobenzene	98	70-130
1,4-Dichlorobenzene	93	70-130
Benzene	89	70-130
Benzyl chloride	98	70-130
Bromomethane	75	70-130
Carbon tetrachloride	85	70-130
Chlorobenzene	95	70-130
Chloroethane	72	70-130
Chloroform	88	70-130
Chloromethane	74	70-130
cis-1,2-Dichloroethene	92	70-130
cis-1,3-Dichloropropene	79	70-130
Dichlorodifluoromethane	72	70-130
Ethylbenzene	101	70-130
1,1,2-Trichloro-1,2,2-Trifluoroethane	80	70-130
1,2-Dichloro-1,1,2,2-tetrafluoroethane	73	70-130
Hexachlorobutadiene	99	70-130
Methylene chloride	73	70-130
p/m-Xylene	98	70-130
o-Xylene	101	70-130
Styrene	79	70-130
Tetrachloroethene	95	70-130
Toluene	100	70-130
trans-1,2-Dichloroethene	80	70-130
trans-1,3-Dichloropropene	79	70-130
Trichloroethene	93	70-130
Trichlorofluoromethane	75	70-130
Vinyl chloride	70	70-130
VIIIyI CIIIOFIde	70	70-130
Petroleum Hydrocarbons in Air I	CS for sample(s	s) 02 (WG223207-2)
1,3-Butadiene	67	70-130
Methyl tert butyl ether	92	70-130
Benzene	78	70-130
Toluene	90	70-130
Ethylbenzene	105	70-130
p/m-Xylene	103	70-130

# ALPHA ANALYTICAL LABORATORIES QUALITY ASSURANCE BATCH SPIKE ANALYSES

Laboratory Job Number: L0514748

Continued

Parameter	% Recovery QC Criteria	
Petroleum Hydrocarbons in Air LCS	for sample(s) 02 (WG223207-2)	
o-Xylene	99 70-130	
Naphthalene	113 70-130	
2-Methylnaphthalene	82 70-130	
C5-C8 Aliphatics, Adjusted	71 70-130	
C9-C12 Aliphatics, Adjusted	99 70-130	
C9-C10 Aromatics	115 70-130	

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# ALPHA ANALYTICAL LABORATORIES QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0514748

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	TE ANAL	II
Plank Analyzaia	for gamp	lo/a) 01 02	/ WC 2 2 2	2025 21			
Blank Analysis Jolatile Organic Compounds in			(WGZZ3			1006 16.45	7 7 7
			2 72	48 TO-14A		1206 16:43	3 Ab
l,1,1-Trichloroethane	ND	ug/m3	2.72				
1,1,2,2-Tetrachloroethane	ND	ug/m3	3.43				
l,1,2-Trichloroethane	ND	ug/m3	2.72				
l,1-Dichloroethane	ND	ug/m3	2.02				
l,1-Dichloroethene	ND	ug/m3	1.98				
1,2,4-Trichlorobenzene	ND	ug/m3	3.71				
1,2,4-Trimethylbenzene	ND	ug/m3	2.46				
,2-Dibromoethane	ND	ug/m3	3.84				
,2-Dichlorobenzene	ND	ug/m3	3.00				
,2-Dichloroethane	ND	ug/m3	2.02				
,2-Dichloropropane	ND	ug/m3	2.31				
l,3,5-Trimethylbenzene	ND	ug/m3	2.46				
l,3-Dichlorobenzene	ND	ug/m3	3.00				
l,4-Dichlorobenzene	ND	ug/m3	3.00				
Benzene	ND	ug/m3	1.60				
Benzyl chloride	ND	ug/m3	2.59				
Bromomethane	ND	ug/m3	1.94				
Carbon tetrachloride	ND	ug/m3	3.14				
Chlorobenzene	ND	ug/m3	2.30				
Chloroethane	ND	ug/m3	1.32				
Chloroform	ND	ug/m3	2.44				
Chloromethane	ND	ug/m3	1.03				
cis-1,2-Dichloroethene	ND	ug/m3	1.98				
cis-1,3-Dichloropropene	ND	ug/m3	2.27				
Dichlorodifluoromethane	ND	ug/m3	4.94				
Ethylbenzene	ND	ug/m3	2.17				
.,1,2-Trichloro-1,2,2-Trifluor	•						
pethane	ND	ug/m3	3.83				
,2-Dichloro-1,1,2,2-tetrafluc	)	_					
coethane	ND	ug/m3	3.49				
Hexachlorobutadiene	ND	ug/m3	5.33				
Methylene chloride	ND	ug/m3	3.47				
p/m-Xylene	ND	ug/m3	4.34				
o-Xylene	ND	ug/m3	2.17				
Styrene	ND	ug/m3	2.13				
Tetrachloroethene	ND	ug/m3	3.39				
Toluene	ND	ug/m3	1.88				
rans-1,2-Dichloroethene	ND	ug/m3	1.98				
rans-1,3-Dichloropropene	ND	ug/m3	2.27				
Trichloroethene	ND	ug/m3	2.68				
Trichlorofluoromethane	ND	ug/m3	2.81				
inyl chloride	ND	ug/m3	1.28				
Blank Analysis	for samp	le(s) 01-02	(WG223	3025-3)			
- ppbV				48 TO-14A		1206 16:43	3 A
1,1,1-Trichloroethane	ND	ppbV	0.500				

# ALPHA ANALYTICAL LABORATORIES QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0514748

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
Blank Analysis	for sampl	le(s) 01-02	(WG223	025-3)		
- ppbV cont'd	-	, ,	`	48 TO-14A	1206 16:4	3 AR
1,1,2,2-Tetrachloroethane	ND	ppbV	0.500			
1,1,2-Trichloroethane	ND	ppbV	0.500			
1,1-Dichloroethane	ND	ppbV	0.500			
1,1-Dichloroethene	ND	ppbV	0.500			
1,2,4-Trichlorobenzene	ND	ppbV	0.500			
1,2,4-Trimethylbenzene	ND	ppbV	0.500			
1,2-Dibromoethane	ND	ppbV	0.500			
1,2-Dichlorobenzene	ND	ppbV	0.500			
1,2-Dichloroethane	ND	ppbV	0.500			
1,2-Dichloropropane	ND	ppbV	0.500			
1,3,5-Trimethylbenzene	ND	Vdqq	0.500			
1,3-Dichlorobenzene	ND	ppbV	0.500			
1,4-Dichlorobenzene	ND	ppbV	0.500			
Benzene	ND	ppbV	0.500			
Benzyl chloride	ND	ppbV	0.500			
Bromomethane	ND	ppbV	0.500			
Carbon tetrachloride	ND	ppbV	0.500			
Chlorobenzene	ND	ppbV	0.500			
Chloroethane	ND	ppbV	0.500			
Chloroform	ND	ppbV	0.500			
Chloromethane	ND	ppbV	0.500			
cis-1,2-Dichloroethene	ND	ppbV	0.500			
cis-1,3-Dichloropropene	ND	ppbV	0.500			
Dichlorodifluoromethane	ND	ppbV	1.00			
Ethylbenzene	ND	Vdqq	0.500			
1,1,2-Trichloro-1,2,2-Trifluor	1.2	PF~·	0.000			
oethane	ND	Vdqq	0.500			
1,2-Dichloro-1,1,2,2-tetrafluo	ND	PPEV	0.500			
roethane	ND	ppbV	0.500			
Hexachlorobutadiene	ND	ppbV	0.500			
Methylene chloride	ND	Vdqq	1.00			
p/m-Xylene	ND	Vdqq	1.00			
o-Xylene	ND	ppbV	0.500			
Styrene	ND	ppbV	0.500			
Tetrachloroethene	ND	ppbV	0.500			
Toluene	ND	ppbV	0.500			
trans-1,2-Dichloroethene	ND	ppbV	0.500			
trans-1,3-Dichloropropene	ND	ppbV	0.500			
Trichloroethene	ND	ppbv	0.500			
Trichlorofluoromethane	ND	ppbv	0.500			
Vinyl chloride			0.500			
vinyi chioride	ND	ppbV	0.500			
Blank Analys	is for sam	mple(s) 02	(WG2232	07-3)		
Petroleum Hydrocarbons in Air				43 DRAFT 1	1206 17:1	7 BT
C5-C8 Aliphatics	ND	ug/m3	24.0			
C9-C12 Aliphatics	ND	ug/m3	28.0			

# ALPHA ANALYTICAL LABORATORIES QUALITY ASSURANCE BATCH BLANK ANALYSIS

Laboratory Job Number: L0514748

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID
					PREP ANAL
Blank Analy	sis for sa	mple(s) 0:	2 (WG2232	207-3)	
Petroleum Hydrocarbons in Air		± , ,	•	43 DRAFT 1	1206 17:17 BT
1,3-Butadiene	ND	ug/m3	2.00		
Methyl tert butyl ether	ND	ug/m3	2.00		
Benzene	ND	ug/m3	2.00		
Toluene	ND	ug/m3	2.00		
Ethylbenzene	ND	ug/m3	2.00		
p/m-Xylene	ND	ug/m3	4.00		
o-Xylene	ND	ug/m3	2.00		
Naphthalene	ND	ug/m3	2.00		
2-Methylnaphthalene	ND	ug/m3	8.00		
C5-C8 Aliphatics, Adjusted	ND	ug/m3	24.0		
C9-C12 Aliphatics, Adjusted	ND	ug/m3	28.0		
C9-C10 Aromatics	ND	ug/m3	24.0		

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#### ALPHA ANALYTICAL LABORATORIES ADDENDUM I

#### REFERENCES

- 43. Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.
- 48. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

ND Not detected in comparison to the reported detection limit.

NI Not Ignitable.

ug/cart Micrograms per Cartridge.

#### LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

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#### ALPHA ANALYTICAL LABORATORIES

#### Eight Walkup Drive Westborough, Massachusetts 01581-1019 (508) 898-9220 www.alphalab.com

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

#### CERTIFICATE OF ANALYSIS

Client: Shaw E&I Laboratory Job Number: L0600156

Address: 100 Technology Center Drive

Stoughton, MA 02072 Date Received: 09-JAN-2006

Attn: Mr David Cobb Date Reported: 12-JAN-2006

Project Number: 681076 Delivery Method: Alpha

Site: OLIN

ALPHA SAMPLE NUMBER CLIENT IDENTIFICATION SAMPLE LOCATION

L0600156-01 PRECARBON WILMINGTON, MA L0600156-02 EFFLUENT WILMINGTON, MA

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized by: Douglos Sheeley
Technical Director

01120614:16 Page 1 of 17

### ALPHA ANALYTICAL LABORATORIES NARRATIVE REPORT

Laboratory Job Number: L0600156

#### TO14

L0600156-01 has elevated limits of detection due to the 10x dilutions required by the elevated concentrations of target compounds in the sample.

The WG226352-1 LCS is reported with low recoveries for 1,2,4 trichlorobenzene and hexachlorobutadiene.

APH

Isopropyl Alcohol, methylene chloride, 2-butanone and trichlorofluoromethane are present in the C5-C8 Aliphatic Hydrocarbon range on -02. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

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#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0600156-01 Date Collected: 06-JAN-2006 14:30

PRECARBON

Date Received: 09-JAN-2006

AIR

Date Reported: 12-JAN-2006

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

Sample Matrix:

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	TE ANAL	ID
Volatile Organic Compounds	in Air - ug/	′m3		48 TO-14A		0110 18:0	19 PS
1,1,1-Trichloroethane	ND	ug/m3	27.2				
1,1,2,2-Tetrachloroethane	ND	ug/m3	34.3				
1,1,2-Trichloroethane	ND	ug/m3	27.2				
1,1-Dichloroethane	ND	ug/m3	20.2				
1,1-Dichloroethene	ND	ug/m3	19.8				
1,2,4-Trichlorobenzene	ND	ug/m3	37.1				
1,2,4-Trimethylbenzene	ND	ug/m3	24.6				
1,2-Dibromoethane	ND	ug/m3	38.4				
1,2-Dichlorobenzene	ND	ug/m3	30.0				
1,2-Dichloroethane	ND	ug/m3	20.2				
1,2-Dichloropropane	ND	ug/m3	23.1				
1,3,5-Trimethylbenzene	ND	ug/m3	24.6				
1,3-Dichlorobenzene	ND	ug/m3	30.0				
1,4-Dichlorobenzene	ND	ug/m3	30.0				
Benzene	ND	ug/m3	16.0				
Benzyl chloride	ND	ug/m3	25.9				
Bromomethane	ND	ug/m3	19.4				
Carbon tetrachloride	ND	ug/m3	31.4				
Chlorobenzene	ND	ug/m3	23.0				
Chloroethane	ND	ug/m3	13.2				
Chloroform	ND	ug/m3	24.4				
Chloromethane	ND	ug/m3	10.3				
cis-1,2-Dichloroethene	ND	ug/m3	19.8				
cis-1,3-Dichloropropene	ND	ug/m3	22.7				
Dichlorodifluoromethane	ND	ug/m3	49.4				
Ethylbenzene	ND	ug/m3	21.7				
1,1,2-Trichloro-1,2,2-Trifl	uor	3.					
oethane	ND	ug/m3	38.3				
1,2-Dichloro-1,1,2,2-tetraf	luo	3.					
roethane	ND	ug/m3	34.9				
Hexachlorobutadiene	ND	ug/m3	53.3				
Methylene chloride	ND	ug/m3	34.7				
p/m-Xylene	ND	ug/m3	43.4				
o-Xylene	ND	ug/m3	21.7				
Styrene	ND	ug/m3	21.3				
Tetrachloroethene	ND	ug/m3	33.9				
Toluene	ND	ug/m3	18.8				
trans-1,2-Dichloroethene	ND	ug/m3	19.8				

Laboratory Sample Number: L0600156-01

PRECARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD		TE	ID
					PREP	ANAL	
Volatile Organic Compounds i	n Air - ug/	m3 cont'd		48 TO-14A		0110 18:	09 PS
trans-1,3-Dichloropropene	ND	ug/m3	22.7				
Trichloroethene	ND	ug/m3	26.8				
Trichlorofluoromethane	ND	ug/m3	28.1				
Vinyl chloride	ND	ug/m3	12.8				
2,4,4-Trimethyl-2-Pentene	158.	ug/m3	22.9				
2,4,4-Trimethyl-1-Pentene	2540	ug/m3	22.9				
Volatile Organic Compounds i	n Air - ppk	οV		48 TO-14A		0110 18:	09 PS
1,1,1-Trichloroethane	ND	ppbV	5.00				
1,1,2,2-Tetrachloroethane	ND	Vdqq	5.00				
1,1,2-Trichloroethane	ND	Vdqq	5.00				
1,1-Dichloroethane	ND	Vdqq	5.00				
1,1-Dichloroethene	ND	ppbV	5.00				
1,2,4-Trichlorobenzene	ND	Vdqq	5.00				
1,2,4-Trimethylbenzene	ND	ppbV	5.00				
1,2-Dibromoethane	ND	Vdqq	5.00				
l,2-Dichlorobenzene	ND	Vdqq	5.00				
l,2-Dichloroethane	ND	ppbV	5.00				
l,2-Dichloropropane	ND	ppbV	5.00				
l,3,5-Trimethylbenzene	ND	ppbV	5.00				
1,3-Dichlorobenzene	ND	ppbV	5.00				
l,4-Dichlorobenzene	ND	ppbV	5.00				
Benzene	ND	ppbV	5.00				
Benzyl chloride	ND	ppbV	5.00				
Bromomethane	ND	ppbV	5.00				
Carbon tetrachloride	ND	ppbV	5.00				
Chlorobenzene	ND	ppbV	5.00				
Chloroethane	ND	ppbV	5.00				
Chloroform	ND	ppbV	5.00				
Chloromethane	ND	ppbV	5.00				
cis-1,2-Dichloroethene	ND	ppbV	5.00				
cis-1,3-Dichloropropene	ND	ppbV	5.00				
Dichlorodifluoromethane	ND	ppbV	10.0				
Ethylbenzene	ND	ppbV	5.00				
1,1,2-Trichloro-1,2,2-Triflu		= =					
oethane	ND	ppbV	5.00				
1,2-Dichloro-1,1,2,2-tetrafl							
roethane	ND	ppbV	5.00				
Hexachlorobutadiene	ND	ppbV	5.00				
Methylene chloride	ND	ppbV	10.0				
p/m-Xylene	ND	ppbV	10.0				
o-Xylene	ND	ppbV	5.00				
Styrene	ND	ppbV	5.00				
Tetrachloroethene	ND	ppbV	5.00				
Coluene	ND	ppbV	5.00				
trans-1,2-Dichloroethene	ND	ppbV	5.00				
trans-1,3-Dichloropropene	ND	yddd	5.00				
Trichloroethene	ND	ppbv	5.00				
Trichlorofluoromethane	ND	ppbV	5.00				
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Laboratory Sample Number: L0600156-01

PRECARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds in Vinyl chloride 2,4,4-Trimethyl-2-Pentene 2,4,4-Trimethyl-1-Pentene	Air - ppbV ND 34.5 555.	cont'd ppbV ppbV ppbV	5.00 5.00 5.00	48 TO-14A	0110 18:09 PS

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0600156-02 Date Collected: 06-JAN-2006 14:20

EFFLUENT Date Received: 09-JAN-2006
AIR Date Reported: 12-JAN-2006

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

Sample Matrix:

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds i	a Air - ug/	′m3		48 TO-14A	0110 16:19 PS
1,1,1-Trichloroethane	ND	ug/m3	2.72	10 10 1111	0110 10:19 18
1,1,2,2-Tetrachloroethane	ND	ug/m3	3.43		
1,1,2-Trichloroethane	ND	ug/m3	2.72		
1,1-Dichloroethane	ND	ug/m3	2.02		
1,1-Dichloroethene	ND	ug/m3	1.98		
1,2,4-Trichlorobenzene	ND	ug/m3	3.71		
1,2,4-Trimethylbenzene	ND	ug/m3	2.46		
1,2-Dibromoethane	ND	ug/m3	3.84		
1,2-Dichlorobenzene	ND	ug/m3	3.00		
1,2-Dichloroethane	ND	ug/m3	2.02		
1,2-Dichloropropane	ND	ug/m3	2.31		
1,3,5-Trimethylbenzene	ND	ug/m3	2.46		
1,3-Dichlorobenzene	ND	ug/m3	3.00		
1,4-Dichlorobenzene	ND	ug/m3	3.00		
Benzene	ND	ug/m3	1.60		
Benzyl chloride	ND	ug/m3	2.59		
Bromomethane	ND	ug/m3	1.94		
Carbon tetrachloride	ND	ug/m3	3.14		
Chlorobenzene	ND	ug/m3	2.30		
Chloroethane	ND	ug/m3	1.32		
Chloroform	ND	ug/m3	2.44		
Chloromethane	ND	ug/m3	1.03		
cis-1,2-Dichloroethene	ND	ug/m3	1.98		
cis-1,3-Dichloropropene	ND	ug/m3	2.27		
Dichlorodifluoromethane	ND	ug/m3	4.94		
Ethylbenzene	ND	ug/m3	2.17		
1,1,2-Trichloro-1,2,2-Triflu		5,			
oethane	ND	ug/m3	3.83		
1,2-Dichloro-1,1,2,2-tetrafl	uo	J			
roethane	ND	ug/m3	3.49		
Hexachlorobutadiene	ND	ug/m3	5.33		
Methylene chloride	ND	ug/m3	3.47		
p/m-Xylene	ND	ug/m3	4.34		
o-Xylene	ND	ug/m3	2.17		
Styrene	ND	ug/m3	2.13		
Tetrachloroethene	ND	ug/m3	3.39		
Toluene	18.8	ug/m3	1.88		
trans-1,2-Dichloroethene	ND	ug/m3	1.98		

Comments: Complete list of References and Glossary of Terms found in Addendum I

Laboratory Sample Number: L0600156-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	TE ANAL	ID
Volatile Organic Compounds i	n Air - ug/	m3 cont'd		48 TO-14A		0110 16:	19 PS
trans-1,3-Dichloropropene	ND	ug/m3	2.27				
Trichloroethene	ND	ug/m3	2.68				
Trichlorofluoromethane	ND	ug/m3	2.81				
Vinyl chloride	ND	ug/m3	1.28				
2,4,4-Trimethyl-2-Pentene	ND	ug/m3	2.29				
2,4,4-Trimethyl-1-Pentene	ND	ug/m3	2.29				
Volatile Organic Compounds i	n Air - ppb	V		48 TO-14A		0110 16:	19 PS
1,1,1-Trichloroethane	ND	Vdqq	0.500				
1,1,2,2-Tetrachloroethane	ND	ppbV	0.500				
1,1,2-Trichloroethane	ND	ppbV	0.500				
1,1-Dichloroethane	ND	ppbV	0.500				
1,1-Dichloroethene	ND	ppbV	0.500				
1,2,4-Trichlorobenzene	ND	ppbV	0.500				
1,2,4-Trimethylbenzene	ND	ppbV	0.500				
1,2-Dibromoethane	ND	ppbV	0.500				
1,2-Dichlorobenzene	ND	ppbV	0.500				
1,2-Dichloroethane	ND	ppbV	0.500				
1,2-Dichloropropane	ND	ppbV	0.500				
1,3,5-Trimethylbenzene	ND	ppbV	0.500				
1,3-Dichlorobenzene	ND	ppbV	0.500				
1,4-Dichlorobenzene	ND	ppbV	0.500				
Benzene	ND	ppbV	0.500				
Benzyl chloride	ND	Vdqq	0.500				
Bromomethane	ND	ppbV	0.500				
Carbon tetrachloride	ND	ppbV	0.500				
Chlorobenzene	ND	ppbV	0.500				
Chloroethane	ND	ppbV	0.500				
Chloroform	ND	ppbV	0.500				
Chloromethane	ND	ppbV	0.500				
cis-1,2-Dichloroethene	ND	ppbV	0.500				
cis-1,3-Dichloropropene	ND	ppbV	0.500				
Dichlorodifluoromethane	ND	Vdqq	1.00				
Ethylbenzene	ND	ppbV	0.500				
1,1,2-Trichloro-1,2,2-Triflu		PPSV	0.500				
oethane	ND	ppbV	0.500				
1,2-Dichloro-1,1,2,2-tetrafl		PPDV	0.500				
roethane	ND	Vdqq	0.500				
Hexachlorobutadiene	ND ND	yddd	0.500				
Methylene chloride	ND ND	ppbv	1.00				
p/m-Xylene	ND ND	yddd	1.00				
o-Xylene	ND ND	yddd	0.500				
Styrene	ND ND	yddd	0.500				
Styrene Tetrachloroethene	ND ND		0.500				
retrachioroethene Toluene	ND 4.98	ppbV ppbV					
trans-1,2-Dichloroethene		ppbV	0.500				
	ND	ppbV	0.500				
trans-1,3-Dichloropropene	ND	Vdqq	0.500				
Trichloroethene	ND	ydqq	0.500				
Trichlorofluoromethane	ND	Vdqq	0.500				

Laboratory Sample Number: L0600156-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds : Vinyl chloride 2,4,4-Trimethyl-2-Pentene 2,4,4-Trimethyl-1-Pentene	in Air - ppbV ND ND ND	cont'd ppbV ppbV ppbV	0.500 0.500 0.500	48 TO-14A	0110 16:19 PS

Laboratory Sample Number: L0600156-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP AN	ID AL
Petroleum Hydrocarbons in Air				43 DRAFT 1	0110	16:19 AR
Qua	lity Contr	ol Informa	ation			
Sample Type: Sample Container Type: Sampling Flow Controller: Sampling Zone: Sampling Flow Meter RPD o Were all QA/QC procedures REQ Were all performance/acceptan Were significant modification	UIRED by t ce standar	nical wn st-samplin he method ds for the	followe e requir	d? ed procedures ac	chieved?	YES YES NO
C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene Toluene Ethylbenzene p/m-Xylene o-Xylene Naphthalene 2-Methylnaphthalene C5-C8 Aliphatics, Adjusted C9-C12 Aliphatics	32.9 ND	ug/m3	24.0 28.0 2.00 2.00 2.00 2.00 4.00 2.00 2.00 8.00 24.0 28.0 24.0			

# ALPHA ANALYTICAL LABORATORIES QUALITY ASSURANCE BATCH DUPLICATE ANALYSIS

Laboratory Job Number: L0600156

Parameter	Value 1	Value 2	Units	RPD	RPD	Limits
Volatile Organic Com	mounds in Ai	r for sampl	e(s) 01-02	(T <sub>1</sub> 06001	56-02	WG226352-2)
1,1,1-Trichloroethane	ND	ND	ug/m3	NC	25	WCZZCSSZ Z,
1,1,2,2-Tetrachloroethane	ND	ND	ug/m3	NC	25	
1,1,2-Trichloroethane	ND	ND	ug/m3	NC	25	
1,1-Dichloroethane	ND	ND	ug/m3	NC	25	
1,1-Dichloroethene	ND	ND	ug/m3	NC	25	
1,2,4-Trichlorobenzene	ND	ND	ug/m3	NC	25	
1,2,4-Trimethylbenzene	ND	ND	ug/m3	NC	25	
1,2-Dibromoethane	ND	ND	ug/m3	NC	25	
1,2-Dichlorobenzene	ND	ND	ug/m3	NC	25	
,,2-Dichloroethane	ND	ND	ug/m3	NC	25	
1,2-Dichloropropane	ND	ND	ug/m3	NC	25	
1,2-bichiolopiopane 1,3,5-Trimethylbenzene	ND	ND	ug/m3	NC	25	
1,3-Dichlorobenzene	ND	ND	ug/m3	NC	25	
l,4-Dichlorobenzene	ND	ND	ug/m3	NC	25	
Benzene	ND	ND	ug/m3	NC	25	
Benzyl chloride	ND	ND	ug/m3	NC	25	
Bromomethane	ND	ND	ug/m3	NC	25	
Carbon tetrachloride	ND	ND	ug/m3	NC	25	
Chlorobenzene	ND	ND	ug/m3	NC	25	
Chloroethane	ND	ND	ug/m3	NC	25	
Chloroform	ND	ND	ug/m3	NC	25	
Chloromethane	ND	ND	ug/m3	NC	25	
cis-1,2-Dichloroethene	ND	ND	ug/m3	NC	25	
sis-1,3-Dichloropropene	ND	ND	ug/m3	NC	25	
oichlorodifluoromethane	ND	ND	ug/m3	NC	25	
Sthylbenzene	ND	ND	ug/m3	NC	25	
.,1,2-Trichloro-1,2,2-Triflu		ND	ug/ili3	IVC	23	
oethane	ND	ND	ug/m3	NC	25	
ethane .,2-Dichloro-1,1,2,2-tetrafl		IND	ug/III3	INC	45	
oethane	ND	ND	ug/m3	NC	25	
Mexachlorobutadiene	ND ND	ND ND	ug/m3	NC NC	25 25	
Methylene chloride	ND ND	ND ND	ug/m3	NC	25	
o/m-Xylene	ND ND	ND ND	ug/m3	NC	25	
o-Xylene	ND ND	ND ND	ug/m3	NC	25	
Styrene	ND	ND	ug/m3	NC	25	
Tetrachloroethene	ND ND	ND ND	ug/m3	NC	25	
Coluene	18.8	18.3	ug/m3	3	25	
rans-1,2-Dichloroethene	ND	ND	ug/m3	NC	25 25	
rans-1,2-Dichloropropene	ND ND	ND ND	ug/m3	NC	25 25	
richloroethene	ND	ND ND	ug/m3	NC	25	
richlorofluoromethane	ND ND	ND ND	ug/m3	NC NC	25 25	
/inyl chloride	ND ND	ND ND	ug/m3	NC	25 25	
2,4,4-Trimethyl-2-Pentene	ND ND	ND ND	ug/m3	NC	25 25	
<del>-</del>						
2,4,4-Trimethyl-1-Pentene	ND	ND	ug/m3	NC	25	

Laboratory Job Number: L0600156

Continued

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Petroleum Hydrocar	bons in Air	for sample	e(s) 02	(L0515675-01	, WG226382-2)
C5-C8 Aliphatics	155.	174.	ug/m3	12	30
C9-C12 Aliphatics	248.	314.	ug/m3	23	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	16.8	19.7	ug/m3	16	30
Benzene	2.66	3.03	ug/m3	13	30
Toluene	16.9	19.2	ug/m3	13	30
Ethylbenzene	2.75	2.98	ug/m3	8	30
p/m-Xylene	7.37	8.20	ug/m3	11	30
o-Xylene	2.10	2.27	ug/m3	8	30
Naphthalene	2.91	3.05	ug/m3	5	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	107.	119.	ug/m3	11	30
C9-C12 Aliphatics, Adjusted	204.	264.	ug/m3	26	30
C9-C10 Aromatics	41.6	47.3	ug/m3	13	30

01120614:16 Page 11 of 17

Laboratory Job Number: L0600156

Parameter	% Recovery	QC Criteria
Veletile Organia Compounds in Nice	ICC for comple/	~\ 01_02_(MG2262E2_1)
Volatile Organic Compounds in Air 1,1,1-Trichloroethane	116	70-130
1,1,2,2-Tetrachloroethane	93	70-130
	93 97	
1,1,2-Trichloroethane		70-130
1,1-Dichloroethane	93	70-130 70-130
1,1-Dichloroethene	91	
1,2,4-Trichlorobenzene	38	70-130
1,2,4-Trimethylbenzene	100	70-130
1,2-Dibromoethane	89	70-130
1,2-Dichlorobenzene	83	70-130
1,2-Dichloroethane	96	70-130
1,2-Dichloropropane	99	70-130
1,3,5-Trimethylbenzene	95	70-130
1,3-Dichlorobenzene	89	70-130
1,4-Dichlorobenzene	86	70-130
Benzene	94	70-130
Benzyl chloride	126	70-130
Bromomethane	81	70-130
Carbon tetrachloride	122	70-130
Chlorobenzene	92	70-130
Chloroethane	81	70-130
Chloroform	97	70-130
Chloromethane	77	70-130
cis-1,2-Dichloroethene	93	70-130
cis-1,3-Dichloropropene	95	70-130
Dichlorodifluoromethane	84	70-130
Ethylbenzene	89	70-130
1,1,2-Trichloro-1,2,2-Trifluoroethane	98	70-130
1,2-Dichloro-1,1,2,2-tetrafluoroethane	84	70-130
Hexachlorobutadiene	56	70-130
Methylene chloride	87	70-130
p/m-Xylene	94	70-130
o-Xylene	102	70-130
Styrene	70	70-130
Tetrachloroethene	88	70-130
Toluene	92	70-130
trans-1,2-Dichloroethene	88	70-130
	88	70-130
trans-1,3-Dichloropropene Trichloroethene	92	70-130
Trichlorofluoromethane	104	70-130
Vinyl chloride	74	70-130
Petroleum Hydrocarbons in Air I	CS for sample(s	) 02 (WG226382-1)
1,3-Butadiene	100	70-130
Methyl tert butyl ether	83	70-130
Benzene	83	70-130
Toluene	89	70-130
Ethylbenzene	96	70-130
p/m-Xylene	97	70-130

Laboratory Job Number: L0600156

Continued

Parameter	% Recovery QC Criteria
Petroleum Hydrocarbons in Air LCS	S for sample(s) 02 (WG226382-1)
o-Xylene	83 70-130
Naphthalene	100 70-130
2-Methylnaphthalene	86 70-130
C5-C8 Aliphatics, Adjusted	96 70-130
C9-C12 Aliphatics, Adjusted	94 70-130
C9-C10 Aromatics	101 70-130

01120614:16 Page 13 of 17

Laboratory Job Number: L0600156

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE II PREP ANAL
Blank Analys:	is for samp	ole(s) 01-0	2 (WG22	6352-3)	
Jolatile Organic Compounds in			,	48 TO-14A	0110 15:42 PS
l,1,1-Trichloroethane	ND	ug/m3	2.72		
l,1,2,2-Tetrachloroethane	ND	ug/m3	3.43		
1,1,2-Trichloroethane	ND	ug/m3	2.72		
l,1-Dichloroethane	ND	ug/m3	2.02		
l,1-Dichloroethene	ND	ug/m3	1.98		
l,2,4-Trichlorobenzene	ND	ug/m3	3.71		
1,2,4-Trimethylbenzene	ND	ug/m3	2.46		
1,2-Dibromoethane	ND	ug/m3	3.84		
1,2-Dichlorobenzene	ND	ug/m3	3.00		
1,2-Dichloroethane	ND	ug/m3	2.02		
1,2-Dichloropropane	ND	ug/m3	2.31		
1,3,5-Trimethylbenzene	ND	ug/m3	2.46		
1,3-Dichlorobenzene	ND		3.00		
l,4-Dichlorobenzene		ug/m3	3.00		
Benzene	ND	ug/m3	1.60		
	ND	ug/m3			
Benzyl chloride	ND	ug/m3	2.59		
Bromomethane	ND	ug/m3	1.94		
Carbon tetrachloride	ND	ug/m3	3.14		
Chlorobenzene	ND	ug/m3	2.30		
Chloroethane	ND	ug/m3	1.32		
Chloroform	ND	ug/m3	2.44		
Chloromethane	ND	ug/m3	1.03		
cis-1,2-Dichloroethene	ND	ug/m3	1.98		
cis-1,3-Dichloropropene	ND	ug/m3	2.27		
Dichlorodifluoromethane	ND	ug/m3	4.94		
Ethylbenzene	ND	ug/m3	2.17		
l,1,2-Trichloro-1,2,2-Trifluo	or				
pethane	ND	ug/m3	3.83		
l,2-Dichloro-1,1,2,2-tetraflu	10				
roethane	ND	ug/m3	3.49		
Hexachlorobutadiene	ND	ug/m3	5.33		
Methylene chloride	ND	ug/m3	3.47		
p/m-Xylene	ND	ug/m3	4.34		
o-Xylene	ND	ug/m3	2.17		
Styrene	ND	ug/m3	2.13		
- Tetrachloroethene	ND	ug/m3	3.39		
Coluene	ND	ug/m3	1.88		
rans-1,2-Dichloroethene	ND	ug/m3	1.98		
crans-1,3-Dichloropropene	ND	ug/m3	2.27		
Trichloroethene	ND	ug/m3	2.68		
Trichlorofluoromethane	ND	ug/m3	2.81		
Jinyl chloride	ND	ug/m3	1.28		
2,4,4-Trimethyl-2-Pentene	ND	ug/m3	2.29		
2,4,4 Trimethyl-1-Pentene	ND	ug/m3	2.29		

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Laboratory Job Number: L0600156

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE I PREP ANAL
Blank Analysi	is for samm	ole(s) 01-0	2 (WG226	352-3)	
Petroleum Hydrocarbons in Air			·	48 TO-14A	0110 15:42 P
Blank Analysi Petroleum Hydrocarbons in Ain		ole(s) 01-0	2 (WG226		0110 15:40
		nnhī7	0 500	48 TO-14A	0110 15:42 P
l,1,1-Trichloroethane	ND	ppbV	0.500		
1,1,2,2-Tetrachloroethane	ND	ppbV	0.500		
1,1,2-Trichloroethane	ND	ppbV	0.500		
l,1-Dichloroethane	ND	ppbV	0.500		
l,1-Dichloroethene	ND	ppbV	0.500		
1,2,4-Trichlorobenzene	ND	ppbV	0.500		
1,2,4-Trimethylbenzene	ND	ppbV	0.500		
1,2-Dibromoethane	ND	ppbV	0.500		
l,2-Dichlorobenzene	ND	ppbV	0.500		
l,2-Dichloroethane	ND	ppbV	0.500		
l,2-Dichloropropane	ND	ppbV	0.500		
1,3,5-Trimethylbenzene	ND	ppbV	0.500		
l,3-Dichlorobenzene	ND	ppbV	0.500		
l,4-Dichlorobenzene	ND	ppbV	0.500		
Benzene	ND	Vdqq	0.500		
Benzyl chloride	ND	ppbV	0.500		
Bromomethane	ND	Vdqq	0.500		
Carbon tetrachloride	ND	Vdqq	0.500		
Chlorobenzene	ND	Vdqq	0.500		
Chloroethane	ND	ydqq	0.500		
Chloroform	ND	ydqq	0.500		
Chloromethane	ND	ydqq	0.500		
cis-1,2-Dichloroethene	ND	ppbV	0.500		
cis-1,3-Dichloropropene	ND	ppbV	0.500		
Dichlorodifluoromethane	ND	Vdqq	1.00		
Ethylbenzene	ND	Vdqq	0.500		
l,1,2-Trichloro-1,2,2-Trifluo	or				
pethane	ND	ppbV	0.500		
l,2-Dichloro-1,1,2,2-tetraflu	10				
roethane	ND	ppbV	0.500		
Hexachlorobutadiene	ND	ppbV	0.500		
Methylene chloride	ND	ppbV	1.00		
o/m-Xylene	ND	ppbV	1.00		
o-Xylene	ND	ppbV	0.500		
Styrene	ND	ppbV	0.500		
Tetrachloroethene	ND	ppbV	0.500		
Toluene	ND	ppbV	0.500		
crans-1,2-Dichloroethene	ND	ppbV	0.500		
crans-1,3-Dichloropropene	ND	ppbV	0.500		
Trichloroethene	ND	ppbv	0.500		
Trichlorofluoromethane	ND	ppbv	0.500		
Jinyl chloride	ND	ppbv	0.500		
2,4,4-Trimethyl-2-Pentene	ND ND	yddd	0.500		

Laboratory Job Number: L0600156

Continued

PARAMETER	RESULT	UNITS	$\mathtt{RDL}$	REF METHOD	DAT	TE ID
					PREP	ANAL
Blank Analy	sis for sa	ample(s) 0	2 (WG226)	382-3)		
Petroleum Hydrocarbons in Air	•			43 DRAFT 1		0110 12:17 AR
C5-C8 Aliphatics	ND	ug/m3	24.0			
C9-C12 Aliphatics	ND	ug/m3	28.0			
1,3-Butadiene	ND	ug/m3	2.00			
Methyl tert butyl ether	ND	ug/m3	2.00			
Benzene	ND	ug/m3	2.00			
Toluene	ND	ug/m3	2.00			
Ethylbenzene	ND	ug/m3	2.00			
p/m-Xylene	ND	ug/m3	4.00			
o-Xylene	ND	ug/m3	2.00			
Naphthalene	ND	ug/m3	2.00			
2-Methylnaphthalene	ND	ug/m3	8.00			
C5-C8 Aliphatics, Adjusted	ND	ug/m3	24.0			
C9-C12 Aliphatics, Adjusted	ND	ug/m3	28.0			
C9-C10 Aromatics	ND	ug/m3	24.0			

01120614:16 Page 16 of 17

### ALPHA ANALYTICAL LABORATORIES ADDENDUM I

#### REFERENCES

- 43. Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.
- 48. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

ND Not detected in comparison to the reported detection limit.

NI Not Ignitable.

ug/cart Micrograms per Cartridge.

### LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

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#### ALPHA ANALYTICAL LABORATORIES

#### Eight Walkup Drive Westborough, Massachusetts 01581-1019 (508) 898-9220 www.alphalab.com

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

#### CERTIFICATE OF ANALYSIS

Client: Shaw E&I Laboratory Job Number: L0602420

Address: 100 Technology Center Drive

Stoughton, MA 02072 Date Received: 21-FEB-2006

Attn: Mr David Cobb Date Reported: 24-FEB-2006

Project Number: 681076 Delivery Method: Alpha

Site: OLIN

ALPHA SAMPLE NUMBER CLIENT IDENTIFICATION SAMPLE LOCATION

L0602420-01 PRE CARBON WILMINGTON, MA L0602420-02 EFFLUENT WILMINGTON, MA

Authorized by: Dong on Sheeley
Technical Director

02240618:23 Page 1 of 17

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

### ALPHA ANALYTICAL LABORATORIES NARRATIVE REPORT

Laboratory Job Number: L0602420

\_\_\_\_\_\_

Volatile Organic Compounds in Air

In order to comply with various regulatory requirements, the results for the analysis of Organic Compounds in Air by EPA TO-14A or TO-15 are provided in ug/m3 as well as ppbv for each sample in a sequential format.

L0602420-01 has elevated limits of detection due to the 10x dilution required by the elevated concentrations of target compounds in the sample.

Petroleum Hydrocarbons in Air

L0602420-02: Trichlorofluoromethane, Methylene chloride, and an unknown siloxane isomer are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

The LCS % recovery for 1,3-Butadiene is above the acceptance criteria for the method.

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### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0602420-01 Date Collected: 17-FEB-2006 11:15

PRE CARBON

Date Received: 21-FEB-2006

Sample Matrix:

AIR

Date Reported: 24-FEB-2006

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

PARAMETER	RESULT	UNITS	RDL	REF METHOD		TE	ID
					PREP	ANAL	
Volatile Organic Compounds	in Air - ug/	m3		48 TO-14A		0222 22:	03 PS
1,1,1-Trichloroethane	ND	ug/m3	27.2				
1,1,2,2-Tetrachloroethane	ND	ug/m3	34.3				
1,1,2-Trichloroethane	ND	ug/m3	27.2				
1,1-Dichloroethane	ND	ug/m3	20.2				
1,1-Dichloroethene	ND	ug/m3	19.8				
1,2,4-Trichlorobenzene	ND	ug/m3	37.1				
1,2,4-Trimethylbenzene	ND	ug/m3	24.6				
1,2-Dibromoethane	ND	ug/m3	38.4				
1,2-Dichlorobenzene	ND	ug/m3	30.0				
1,2-Dichloroethane	ND	ug/m3	20.2				
1,2-Dichloropropane	ND	ug/m3	23.1				
1,3,5-Trimethylbenzene	ND	ug/m3	24.6				
1,3-Dichlorobenzene	ND	ug/m3	30.0				
1,4-Dichlorobenzene	ND	ug/m3	30.0				
Benzene	ND	ug/m3	16.0				
Benzyl chloride	ND	ug/m3	25.9				
Bromomethane	ND	ug/m3	19.4				
Carbon tetrachloride	ND	ug/m3	31.4				
Chlorobenzene	ND	ug/m3	23.0				
Chloroethane	ND	ug/m3	13.2				
Chloroform	ND	ug/m3	24.4				
Chloromethane	ND	ug/m3	10.3				
cis-1,2-Dichloroethene	ND	ug/m3	19.8				
cis-1,3-Dichloropropene	ND	ug/m3	22.7				
Dichlorodifluoromethane	ND	ug/m3	49.4				
Ethylbenzene	ND	ug/m3	21.7				
1,1,2-Trichloro-1,2,2-Trifl	uor						
oethane	ND	ug/m3	38.3				
1,2-Dichloro-1,1,2,2-tetraf	luo						
roethane	ND	ug/m3	34.9				
Hexachlorobutadiene	ND	ug/m3	53.3				
Methylene chloride	ND	ug/m3	34.7				
p/m-Xylene	ND	ug/m3	43.4				
o-Xylene	ND	ug/m3	21.7				
Styrene	ND	ug/m3	21.3				
Tetrachloroethene	ND	ug/m3	33.9				
Toluene	ND	ug/m3	18.8				
trans-1,2-Dichloroethene	ND	ug/m3	19.8				

Comments: Complete list of References and Glossary of Terms found in Addendum I

Laboratory Sample Number: L0602420-01

PRE CARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD		TE	ID
					PREP	ANAL	
Volatile Organic Compounds i	n Air - ug/	m3 cont'd		48 TO-14A		0222 22:	03 PS
trans-1,3-Dichloropropene	ND	ug/m3	22.7				
Trichloroethene	ND	ug/m3	26.8				
Trichlorofluoromethane	ND	ug/m3	28.1				
Vinyl bromide	ND	ug/m3	21.8				
Vinyl chloride	ND	ug/m3	12.8				
2,4,4-Trimethyl-2-Pentene	ND	ug/m3	22.9				
2,4,4-Trimethyl-1-Pentene	947	ug/m3	22.9				
Volatile Organic Compounds i	n Air - ppk	νV		48 TO-14A		0222 22:	03 PS
1,1,1-Trichloroethane	ND	ppbV	5.00				
1,1,2,2-Tetrachloroethane	ND	Vdqq	5.00				
1,1,2-Trichloroethane	ND	ppbV	5.00				
1,1-Dichloroethane	ND	Vdqq	5.00				
1,1-Dichloroethene	ND	Vdqq	5.00				
1,2,4-Trichlorobenzene	ND	ydqq	5.00				
1,2,4-Trimethylbenzene	ND	ppbV	5.00				
1,2-Dibromoethane	ND	ppbV	5.00				
1,2-Dichlorobenzene	ND	ppbV	5.00				
1,2-Dichloroethane	ND	ppbV	5.00				
1,2-Dichloropropane	ND	ppbV	5.00				
1,3,5-Trimethylbenzene	ND	ppbV	5.00				
1,3-Dichlorobenzene	ND	ppbV	5.00				
l,4-Dichlorobenzene	ND	ppbV	5.00				
Benzene	ND	ppbV	5.00				
Benzyl chloride	ND	ppbV	5.00				
Bromomethane	ND	ppbV	5.00				
Carbon tetrachloride	ND	ppbV	5.00				
Chlorobenzene	ND	ppbV	5.00				
Chloroethane	ND	ppbV	5.00				
Chloroform	ND	ppbV	5.00				
Chloromethane	ND	ppbV	5.00				
cis-1,2-Dichloroethene	ND	ppbV	5.00				
cis-1,3-Dichloropropene	ND	ppbV	5.00				
Dichlorodifluoromethane	ND	ppbV	10.0				
Ethylbenzene	ND	ppbV	5.00				
1,1,2-Trichloro-1,2,2-Triflu	or						
pethane	ND	ppbV	5.00				
1,2-Dichloro-1,1,2,2-tetrafl	uo						
roethane	ND	ppbV	5.00				
Hexachlorobutadiene	ND	ppbV	5.00				
Methylene chloride	ND	ppbV	10.0				
p/m-Xylene	ND	ppbV	10.0				
o-Xylene	ND	ppbV	5.00				
Styrene	ND	ppbV	5.00				
Tetrachloroethene	ND	ppbV	5.00				
Гoluene	ND	ppbV	5.00				
trans-1,2-Dichloroethene	ND	ppbV	5.00				
trans-1,3-Dichloropropene	ND	ppbV	5.00				
Trichloroethene	ND	ppbV	5.00				

Laboratory Sample Number: L0602420-01

PRE CARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID
					PREP ANAL
Volatile Organic Compounds in	n Air - ppbV	cont'd		48 TO-14A	0222 22:03 PS
Trichlorofluoromethane	ND	Vdqq	5.00		
Vinyl bromide	ND	Vdqq	5.00		
Vinyl chloride	ND	Vdqq	5.00		
2,4,4-Trimethyl-2-Pentene	ND	ppbV	5.00		
2,4,4-Trimethyl-1-Pentene	207	ppbV	5.00		

### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0602420-02 Date Collected: 17-FEB-2006 11:00

EFFLUENT Date Received: 21-FEB-2006
AIR Date Reported: 24-FEB-2006

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

Sample Matrix:

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	TE ANAL	ID
Volatile Organic Compounds	in Air - ug/	m3		48 TO-14A		0223 01:	50 PS
1,1,1-Trichloroethane	ND	ug/m3	2.72				
1,1,2,2-Tetrachloroethane	ND	ug/m3	3.43				
1,1,2-Trichloroethane	ND	ug/m3	2.72				
1,1-Dichloroethane	ND	ug/m3	2.02				
1,1-Dichloroethene	ND	ug/m3	1.98				
1,2,4-Trichlorobenzene	ND	ug/m3	3.71				
1,2,4-Trimethylbenzene	ND	ug/m3	2.46				
1,2-Dibromoethane	ND	ug/m3	3.84				
1,2-Dichlorobenzene	ND	ug/m3	3.00				
1,2-Dichloroethane	ND	ug/m3	2.02				
1,2-Dichloropropane	ND	ug/m3	2.31				
1,3,5-Trimethylbenzene	ND	ug/m3	2.46				
1,3-Dichlorobenzene	ND	ug/m3	3.00				
1,4-Dichlorobenzene	ND	ug/m3	3.00				
Benzene	ND	ug/m3	1.60				
Benzyl chloride	ND	ug/m3	2.59				
Bromomethane	ND	ug/m3	1.94				
Carbon tetrachloride	ND	ug/m3	3.14				
Chlorobenzene	ND	ug/m3	2.30				
Chloroethane	ND	ug/m3	1.32				
Chloroform	ND	ug/m3	2.44				
Chloromethane	ND	ug/m3	1.03				
cis-1,2-Dichloroethene	ND	ug/m3	1.98				
cis-1,3-Dichloropropene	ND	ug/m3	2.27				
Dichlorodifluoromethane	5.28	ug/m3	4.94				
Ethylbenzene	ND	ug/m3	2.17				
1,1,2-Trichloro-1,2,2-Trifl	uor						
oethane	ND	ug/m3	3.83				
1,2-Dichloro-1,1,2,2-tetraf	luo						
roethane	ND	ug/m3	3.49				
Hexachlorobutadiene	ND	ug/m3	5.33				
Methylene chloride	ND	ug/m3	3.47				
p/m-Xylene	ND	ug/m3	4.34				
o-Xylene	ND	ug/m3	2.17				
Styrene	ND	ug/m3	2.13				
Tetrachloroethene	ND	ug/m3	3.39				
Toluene	ND	ug/m3	1.88				
trans-1,2-Dichloroethene	ND	ug/m3	1.98				

Laboratory Sample Number: L0602420-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA PREP	TE ANAL	ID
Volatile Organic Compounds i	_			48 TO-14A		0223 01:50	) PS
trans-1,3-Dichloropropene	ND	ug/m3	2.27				
Trichloroethene	ND	ug/m3	2.68				
Trichlorofluoromethane	22.0	ug/m3	2.81				
Vinyl bromide	ND	ug/m3	2.18				
Vinyl chloride	ND	ug/m3	1.28				
2,4,4-Trimethyl-2-Pentene	ND	ug/m3	2.29				
2,4,4-Trimethyl-1-Pentene	4.45	ug/m3	2.29				
Volatile Organic Compounds i	n Air - ppb	V		48 TO-14A		0223 01:50	) PS
l,1,1-Trichloroethane	ND	Vdqq	0.500				
1,1,2,2-Tetrachloroethane	ND	Vdqq	0.500				
1,1,2-Trichloroethane	ND	Vdqq	0.500				
1,1-Dichloroethane	ND	Vdqq	0.500				
l,1-Dichloroethene	ND	Vdqq	0.500				
1,2,4-Trichlorobenzene	ND	ppbV	0.500				
1,2,4-Trimethylbenzene	ND	ppbV	0.500				
l,2-Dibromoethane	ND	Vdqq	0.500				
l,2-Dichlorobenzene	ND	ppbV	0.500				
1,2-Dichloroethane	ND	ppbV	0.500				
l,2-Dichloropropane	ND	ppbV	0.500				
1,3,5-Trimethylbenzene	ND	ppbV	0.500				
l,3-Dichlorobenzene	ND	ppbV	0.500				
l,4-Dichlorobenzene	ND	ppbV	0.500				
Benzene	ND	ppbV	0.500				
Benzyl chloride	ND	ppbV	0.500				
Bromomethane	ND	Vdqq	0.500				
Carbon tetrachloride	ND	Vdqq	0.500				
Chlorobenzene	ND	ppbV	0.500				
Chloroethane	ND	ppbV	0.500				
Chloroform	ND	ppbV	0.500				
Chloromethane	ND	ppbV	0.500				
cis-1,2-Dichloroethene	ND	ppbV	0.500				
cis-1,3-Dichloropropene	ND	ppbV	0.500				
Dichlorodifluoromethane	1.07	ppbV	1.00				
Ethylbenzene	ND	ppbV	0.500				
l,1,2-Trichloro-1,2,2-Triflu	ıor						
pethane	ND	ppbV	0.500				
l,2-Dichloro-1,1,2,2-tetraf]	uo						
roethane	ND	ppbV	0.500				
Hexachlorobutadiene	ND	ppbV	0.500				
Methylene chloride	ND	ppbV	1.00				
p/m-Xylene	ND	ppbV	1.00				
o-Xylene	ND	ppbV	0.500				
Styrene	ND	ppbV	0.500				
Tetrachloroethene	ND	ppbV	0.500				
Foluene	ND	ppbV	0.500				
trans-1,2-Dichloroethene	ND	ppbV	0.500				
crans-1,3-Dichloropropene	ND	ppbV	0.500				
Trichloroethene	ND	ppbV	0.500				

Laboratory Sample Number: L0602420-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID
					PREP ANAL
Volatile Organic Compounds is	n Air - ppbV	cont'd		48 TO-14A	0223 01:50 PS
Trichlorofluoromethane	3.92	Vdqq	0.500		
Vinyl bromide	ND	Vdqq	0.500		
Vinyl chloride	ND	Vdqq	0.500		
2,4,4-Trimethyl-2-Pentene	ND	ppbV	0.500		
2,4,4-Trimethyl-1-Pentene	0.971	Vdqq	0.500		

Laboratory Sample Number: L0602420-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATI	E ID
					PREP	ANAL
Petroleum Hydrocarbons in Ai	.r			43 DRAFT 1	02	223 01:50 AR
Qu	ality Cont	rol Informa	ation			
Sample Type: Sample Container Type: Sampling Flow Controller Sampling Zone: Sampling Flow Meter RPD Were all QA/QC procedures RE Were all performance/accepta 1. One or more of the APH	Unkn of pre & p QUIRED by ance standa	ster anical own ost-samplir the method rds for the	followe requir	d? ed procedures a		YES NO
			_		11 20	170
Were significant modificatio		the method	d as spe		11.3?	NO
Were significant modificatio C5-C8 Aliphatics	ns made to	the method ug/m3	as spe		11.3?	NO
Were significant modificatio C5-C8 Aliphatics C9-C12 Aliphatics	ns made to ND ND	ug/m3 ug/m3	24.0 28.0		11.3?	NO
Were significant modificatio C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene	ons made to  ND  ND  ND	ug/m3 ug/m3 ug/m3	24.0 28.0 2.00		11.3?	NO
Were significant modificatio C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether	ons made to  ND  ND  ND  ND  ND	ug/m3 ug/m3 ug/m3 ug/m3	24.0 28.0 2.00 2.00		11.3?	NO
Were significant modification C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene	ns made to  ND ND ND ND ND ND ND	ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	24.0 28.0 2.00 2.00 2.00		11.3?	NO
Were significant modification C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene Toluene	ns made to  ND ND ND ND ND ND ND ND ND	ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	24.0 28.0 2.00 2.00 2.00 2.00		11.3?	NO
Were significant modification C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene Toluene Ethylbenzene	ND	ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	24.0 28.0 2.00 2.00 2.00 2.00 2.00		11.3?	NO
Were significant modification C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene Toluene Ethylbenzene p/m-Xylene	ND N	ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3 ug/m3	24.0 28.0 2.00 2.00 2.00 2.00 2.00 4.00		11.3?	NO
Were significant modification C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene Toluene Ethylbenzene p/m-Xylene o-Xylene	ND N	ug/m3	24.0 28.0 2.00 2.00 2.00 2.00 2.00 4.00 2.00		11.3?	NO
Were significant modification C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene Toluene Ethylbenzene p/m-Xylene o-Xylene Naphthalene	ND N	ug/m3	24.0 28.0 2.00 2.00 2.00 2.00 2.00 4.00 2.00 2.		11.3?	NO
Were significant modification C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene Toluene Ethylbenzene p/m-Xylene o-Xylene Naphthalene 2-Methylnaphthalene	ND N	ug/m3	24.0 28.0 2.00 2.00 2.00 2.00 2.00 4.00 2.00		11.3?	NO
Were significant modification C5-C8 Aliphatics C9-C12 Aliphatics 1,3-Butadiene Methyl tert butyl ether Benzene Toluene Ethylbenzene p/m-Xylene o-Xylene Naphthalene	ND N	ug/m3	24.0 28.0 2.00 2.00 2.00 2.00 2.00 2.00 2.		11.3?	NO

Laboratory Job Number: L0602420

Parameter	Value 1	Value 2	Units	RPD	RPD Limits	
Volatile Organic Com	mounds in Air	r for sampl	e(g) 01-02	(1.06024	20-01 WG230679-2)	
1,1,1-Trichloroethane	ND	ND	ug/m3	NC	25	
1,1,2,2-Tetrachloroethane	ND	ND	ug/m3	NC	25	
1,1,2-Trichloroethane	ND	ND	ug/m3	NC	25	
1,1-Dichloroethane	ND	ND	ug/m3	NC	25	
1,1-Dichloroethene	ND	ND	ug/m3	NC	25	
1,2,4-Trichlorobenzene	ND	ND	ug/m3	NC	25	
1,2,4-Trimethylbenzene	ND	ND	ug/m3	NC	25	
1,2-Dibromoethane	ND	ND	ug/m3	NC	25	
1,2-Dichlorobenzene	ND	ND	ug/m3	NC	25	
1,2-Dichloroethane	ND	ND	ug/m3	NC	25	
1,2-Dichloropropane	ND	ND	ug/m3	NC	25	
1,3,5-Trimethylbenzene	ND	ND	ug/m3	NC	25	
1,3-Dichlorobenzene	ND	ND ND	ug/m3	NC	25	
1,4-Dichlorobenzene	ND	ND	ug/m3	NC	25	
Benzene	ND	ND	ug/m3	NC	25	
Benzyl chloride	ND	ND	ug/m3	NC	25	
Bromomethane	ND	ND	ug/m3	NC	25	
Carbon tetrachloride	ND	ND	ug/m3	NC	25	
Chlorobenzene	ND	ND	ug/m3	NC	25	
Chloroethane	ND	ND	ug/m3	NC	25	
Chloroform	ND	ND ND	ug/m3	NC	25	
Chloromethane	ND	ND ND	ug/m3	NC	25	
cis-1,2-Dichloroethene	ND	ND ND		NC	25	
cis-1,3-Dichloropropene	ND ND	ND ND	ug/m3	NC NC	25	
Dichlorodifluoromethane	ND	ND	ug/m3	NC	25	
Ethylbenzene	ND ND	ND ND	ug/m3	NC NC	25	
1,1,2-Trichloro-1,2,2-Triflu		ND	ug/m3	NC	25	
		NID		NO	25	
oethane	ND	ND	ug/m3	NC	25	
1,2-Dichloro-1,1,2,2-tetraflroethane		NID		NO	25	
roethane Hexachlorobutadiene	ND	ND	ug/m3	NC	25	
Methylene chloride	ND	ND	ug/m3	NC	25 25	
-	ND	ND	ug/m3	NC		
p/m-Xylene	ND	ND	ug/m3	NC	25 25	
o-Xylene	ND	ND	ug/m3 ug/m3	NC		
Styrene Tetrachloroethene	ND	ND		NC	25	
	ND	ND	ug/m3	NC	25	
Toluene	ND	ND	ug/m3	NC	25	
trans-1,2-Dichloroethene	ND	ND	ug/m3	NC NC	25	
trans-1,3-Dichloropropene	ND	ND	ug/m3	NC	25	
Trichloroethene	ND	ND	ug/m3	NC	25	
Trichlorofluoromethane	ND	ND	ug/m3	NC	25	
Vinyl bromide	ND	ND	ug/m3	NC	25	
Vinyl chloride	ND	ND	ug/m3	NC	25	
2,4,4-Trimethyl-2-Pentene	ND	ND	ug/m3	NC	25	
2,4,4-Trimethyl-1-Pentene	947	998	ug/m3	5	25	

Laboratory Job Number: L0602420

Continued

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Petroleum Hydroca	rbons in Air	for sampl	e(s) 02 (	L0602437-	01, WG230591-2)
C5-C8 Aliphatics	35.9	35.6	ug/m3	1	30
C9-C12 Aliphatics	ND	ND	ug/m3	NC	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	ND	ND	ug/m3	NC	30
Toluene	4.91	4.73	ug/m3	4	30
Ethylbenzene	ND	ND	ug/m3	NC	30
p/m-Xylene	4.32	4.04	ug/m3	7	30
o-Xylene	ND	ND	ug/m3	NC	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	ND	ND	ug/m3	NC	30
C9-C12 Aliphatics, Adjusted	ND	ND	ug/m3	NC	30
C9-C10 Aromatics	ND	ND	ug/m3	NC	30

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Laboratory Job Number: L0602420

Parameter	% Recovery	QC Criteria
Volatile Organic Compounds in Air I	CS for sample(	s) 01-02 (WG230679-4)
1,1,1-Trichloroethane	116	70-130
1,1,2,2-Tetrachloroethane	104	70-130
1,1,2-Trichloroethane	117	70-130
1,1-Dichloroethane	127	70-130
1,1-Dichloroethene	113	70-130
1,2,4-Trichlorobenzene	75	70-130
1,2,4-Trimethylbenzene	122	70-130
1,2-Dibromoethane	105	70-130
1,2-Dichlorobenzene	122	70-130
1,2-Dichloroethane	120	70-130
1,2-Dichloropropane	124	70-130
1,3,5-Trimethylbenzene	124	70-130
1,3-Dichlorobenzene	128	70-130
1,4-Dichlorobenzene	126	70-130
Benzene	128	70-130
Benzyl chloride	96	70-130
Bromomethane	104	70-130
Carbon tetrachloride	109	70-130
Chlorobenzene	115	70-130
Chloroethane	117	70-130
Chloroform	107	70-130
Chloromethane	115	70-130
cis-1,2-Dichloroethene	108	70-130
cis-1,3-Dichloropropene	120	70-130
Dichlorodifluoromethane	97	70-130
Ethylbenzene	112	70-130
1,1,2-Trichloro-1,2,2-Trifluoroethane	114	70-130
1,2-Dichloro-1,1,2,2-tetrafluoroethane	103	70-130
Hexachlorobutadiene	95	70-130
Methylene chloride	121	70-130
p/m-Xylene	112	70-130
o-Xylene	114	70-130
Styrene	93	70-130
Tetrachloroethene	109	70-130
Toluene	118	70-130
trans-1,2-Dichloroethene	119	70-130
trans-1,3-Dichloropropene	96	70-130
Trichloroethene	118	70-130
Trichlorofluoromethane	103	70-130
Vinyl bromide	110	70-130
Vinyl chloride	103	70-130
Petroleum Hydrocarbons in Air LC	S for sample(s	) 02 (WG230591-1)
1,3-Butadiene	147	70-130
Methyl tert butyl ether	109	70-130
Benzene	120	70-130
Toluene	112	70-130
Ethylbenzene	113	70-130

Laboratory Job Number: L0602420

Continued

Parameter	% Recovery QC Criteria	
Petroleum Hydrocarbons in Air	LCS for sample(s) 02 (WG230591-1)	
p/m-Xylene	113 70-130	
o-Xylene	114 70-130	
Naphthalene	78 70-130	
2-Methylnaphthalene	115 70-130	
C5-C8 Aliphatics, Adjusted	129 70-130	
C9-C12 Aliphatics, Adjusted	114 70-130	
C9-C10 Aromatics	116 70-130	

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Laboratory Job Number: L0602420

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE I PREP ANAL
Blank Analys	sis for samp	ole(s) 01-0	)2 (WG23	0679-5)	
Volatile Organic Compounds i			,	48 TO-14A	0222 14:48 P
1,1,1-Trichloroethane	ND	ug/m3	2.72	10 10 1111	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
1,1,2,2-Tetrachloroethane	ND	ug/m3	3.43		
1,1,2-Trichloroethane	ND	ug/m3	2.72		
1,1-Dichloroethane	ND	ug/m3	2.02		
1,1-Dichloroethene	ND	ug/m3	1.98		
1,2,4-Trichlorobenzene	ND	ug/m3	3.71		
1,2,4-Trimethylbenzene	ND	ug/m3	2.46		
1,2-Dibromoethane	ND	ug/m3	3.84		
1,2-Dichlorobenzene	ND	ug/m3	3.00		
1,2-Dichloroethane	ND	ug/m3	2.02		
1,2-Dichloropropane	ND	ug/m3	2.31		
1,3,5-Trimethylbenzene	ND	ug/m3	2.46		
1,3-Dichlorobenzene	ND	ug/m3	3.00		
1,4-Dichlorobenzene	ND	ug/m3	3.00		
Benzene	ND	ug/m3	1.60		
Benzyl chloride	ND	ug/m3	2.59		
Bromomethane	ND	ug/m3	1.94		
Carbon tetrachloride	ND	ug/m3	3.14		
Chlorobenzene	ND	ug/m3	2.30		
Chloroethane	ND	ug/m3	1.32		
Chloroform	ND ND		2.44		
Chloromethane		ug/m3	1.03		
	ND	ug/m3			
cis-1,2-Dichloroethene	ND	ug/m3	1.98		
cis-1,3-Dichloropropene	ND	ug/m3	2.27		
Dichlorodifluoromethane	ND	ug/m3	4.94		
Ethylbenzene	ND	ug/m3	2.17		
l,1,2-Trichloro-1,2,2-Triflu		, 2	2 02		
oethane	ND	ug/m3	3.83		
1,2-Dichloro-1,1,2,2-tetraf		, ,	2 42		
roethane	ND	ug/m3	3.49		
Hexachlorobutadiene	ND	ug/m3	5.33		
Methylene chloride	ND	ug/m3	3.47		
p/m-Xylene	ND	ug/m3	4.34		
o-Xylene	ND	ug/m3	2.17		
Styrene	ND	ug/m3	2.13		
Tetrachloroethene	ND	ug/m3	3.39		
Foluene	ND	ug/m3	1.88		
trans-1,2-Dichloroethene	ND	ug/m3	1.98		
crans-1,3-Dichloropropene	ND	ug/m3	2.27		
Trichloroethene	ND	ug/m3	2.68		
Trichlorofluoromethane	ND	ug/m3	2.81		
Jinyl bromide	ND	ug/m3	2.18		
Jinyl chloride	ND	ug/m3	1.28		
2,4,4-Trimethyl-2-Pentene	ND	ug/m3	2.29		
2,4,4-Trimethyl-1-Pentene	ND	ug/m3	2.29		

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Laboratory Job Number: L0602420

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE PREP ANAL	ID
Blank Analysis	s for samp	le(s) 01-02	(WG230	0679-5)		
Petroleum Hydrocarbons in Air			,	48 TO-14A	0222 14:48	B PS
Blank Analysis		le(s) 01-02	(WG230	0679-5)		
Petroleum Hydrocarbons in Air	- ppbV			48 TO-14A	0222 14:48	B PS
1,1,1-Trichloroethane	ND	ppbV	0.500			
1,1,2,2-Tetrachloroethane	ND	ppbV	0.500			
1,1,2-Trichloroethane	ND	ppbV	0.500			
1,1-Dichloroethane	ND	ppbV	0.500			
1,1-Dichloroethene	ND	ppbV	0.500			
1,2,4-Trichlorobenzene	ND	ppbV	0.500			
1,2,4-Trimethylbenzene	ND	ppbV	0.500			
1,2-Dibromoethane	ND	ppbV	0.500			
1,2-Dichlorobenzene	ND	Vdqq	0.500			
1,2-Dichloroethane	ND	Vdqq	0.500			
1,2-Dichloropropane	ND	Vdqq	0.500			
1,3,5-Trimethylbenzene	ND	Vdqq	0.500			
1,3-Dichlorobenzene	ND	Vdqq	0.500			
1,4-Dichlorobenzene	ND	Vdqq	0.500			
Benzene	ND	ppbV	0.500			
Benzyl chloride	ND	ppbV	0.500			
Bromomethane	ND	ppbV	0.500			
Carbon tetrachloride	ND	ppbV	0.500			
Chlorobenzene	ND	ppbV	0.500			
Chloroethane	ND	ppbV	0.500			
Chloroform	ND	ppbV	0.500			
Chloromethane	ND	ppbV	0.500			
cis-1,2-Dichloroethene	ND	ppbV	0.500			
cis-1,3-Dichloropropene	ND	ppbV	0.500			
Dichlorodifluoromethane	ND	ppbV	1.00			
Ethylbenzene	ND	ppbV	0.500			
1,1,2-Trichloro-1,2,2-Trifluor	2					
oethane	ND	ppbV	0.500			
1,2-Dichloro-1,1,2,2-tetrafluo	)					
roethane	ND	ppbV	0.500			
Hexachlorobutadiene	ND	ppbV	0.500			
Methylene chloride	ND	ppbV	1.00			
p/m-Xylene	ND	ppbV	1.00			
o-Xylene	ND	ppbV	0.500			
Styrene	ND	ppbV	0.500			
Tetrachloroethene	ND	ppbV	0.500			
Toluene	ND	ppbV	0.500			
trans-1,2-Dichloroethene	ND	ppbV	0.500			
trans-1,3-Dichloropropene	ND	ppbV	0.500			
Trichloroethene	ND	ppbV	0.500			
Trichlorofluoromethane	ND	ppbV	0.500			
Vinyl bromide	ND	ppbV	0.500			
Vinyl chloride	ND	ppbV	0.500			
2,4,4-Trimethyl-2-Pentene	ND	Vdqq	0.500			
2,4,4-Trimethyl-1-Pentene	ND	ppbV	0.500			

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Laboratory Job Number: L0602420

Continued

PARAMETER	RESULT	UNITS	$\mathtt{RDL}$	REF METHOD	DATE	ID
					PREP ANAL	
Blank Analy	sis for sa	mple(s) 0	2 (WG2305	591-3)		
Petroleum Hydrocarbons in Air				43 DRAFT 1	0222 14	:48 AR
C5-C8 Aliphatics	ND	ug/m3	24.0			
C9-C12 Aliphatics	ND	ug/m3	28.0			
1,3-Butadiene	ND	ug/m3	2.00			
Methyl tert butyl ether	ND	ug/m3	2.00			
Benzene	ND	ug/m3	2.00			
Toluene	ND	ug/m3	2.00			
Ethylbenzene	ND	ug/m3	2.00			
p/m-Xylene	ND	ug/m3	4.00			
o-Xylene	ND	ug/m3	2.00			
Naphthalene	ND	ug/m3	2.00			
2-Methylnaphthalene	ND	ug/m3	8.00			
C5-C8 Aliphatics, Adjusted	ND	ug/m3	24.0			
C9-C12 Aliphatics, Adjusted	ND	ug/m3	28.0			
C9-C10 Aromatics	ND	ug/m3	24.0			

02240618:23 Page 16 of 17

### ALPHA ANALYTICAL LABORATORIES ADDENDUM I

#### REFERENCES

- 43. Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.
- 48. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

ND Not detected in comparison to the reported detection limit.

NI Not Ignitable.

ug/cart Micrograms per Cartridge.

#### LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

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02240618:23 Page 17 of 17

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#### ALPHA ANALYTICAL LABORATORIES

#### Eight Walkup Drive Westborough, Massachusetts 01581-1019 (508) 898-9220 www.alphalab.com

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

#### CERTIFICATE OF ANALYSIS

Client: Shaw E&I Laboratory Job Number: L0603794

Address: 100 Technology Center Drive

Stoughton, MA 02072 Date Received: 20-MAR-2006

Attn: Mr David Cobb Date Reported: 27-MAR-2006

Project Number: 681076 Delivery Method: Alpha

Site: OLIN

ALPHA SAMPLE NUMBER CLIENT IDENTIFICATION SAMPLE LOCATION

L0603794-01 PRE CARBON WILMINGTON, MA L0603794-02 EFFLUENT WILMINGTON, MA

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized by: Technical Director

03270615:43 Page 1 of 16

### ALPHA ANALYTICAL LABORATORIES NARRATIVE REPORT

Laboratory Job Number: L0603794

Volatile Organic Compounds in Air

In order to comply with various regulatory requirements, the results for the analysis of Organic Compounds in Air by EPA TO-14A or TO-15 are provided in ug/m3 as well as ppbv for each sample in a sequential format.

L0603794-01 has elevated limits of detection due to the 10x dilution required by the elevated concentrations of target compounds in the sample.

The LCS % recovery for 1,1-Dichloropropane is above the acceptance criteria for the method.

The LCS % recoveries for 1,1-Dichloroethane and Bromomethane are below the acceptance criteria for the method.

Petroleum Hydrocarbons in Air

L0603794-02: Methylene chloride and Trichlorofluoromethane are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

The LCS % recovery for 2-Methylnaphthalene is below the acceptance criteria for the method.

### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0603794-01 Date Collected: 17-MAR-2006 12:15

PRE CARBON

Date Received: 20-MAR-2006

Sample Matrix:

Date Reported: 27-MAR-2006

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds	in Air - ug/	′m3		48 TO-14A	0325 12:37 PS
1,1,1-Trichloroethane	ND ND	ug/m3	27.2	AFI OF OF	0323 12·37 FB
1,1,2,2-Tetrachloroethane	ND	ug/m3	34.3		
1,1,2-Trichloroethane	ND	ug/m3	27.2		
1,1-Dichloroethane	ND	ug/m3	20.2		
1,1-Dichloroethene	ND	ug/m3	19.8		
1,2,4-Trichlorobenzene	ND	ug/m3	37.1		
1,2,4-Trimethylbenzene	ND	ug/m3	24.6		
1,2-Dibromoethane	ND	ug/m3	38.4		
1,2-Dichlorobenzene	ND	ug/m3	30.0		
1,2-Dichloroethane	ND	ug/m3	20.2		
1,2-Dichloropropane	ND	ug/m3	23.1		
1,3,5-Trimethylbenzene	ND	ug/m3	24.6		
1,3-Dichlorobenzene	ND	ug/m3	30.0		
1,4-Dichlorobenzene	ND	ug/m3	30.0		
Benzene	ND	ug/m3	16.0		
Benzyl chloride	ND	ug/m3	25.9		
Bromomethane	ND	ug/m3	19.4		
Carbon tetrachloride	ND	ug/m3	31.4		
Chlorobenzene	ND	ug/m3	23.0		
Chloroethane	ND	ug/m3	13.2		
Chloroform	ND	ug/m3	24.4		
Chloromethane	ND	ug/m3	10.3		
cis-1,2-Dichloroethene	ND	ug/m3	19.8		
cis-1,3-Dichloropropene	ND	ug/m3	22.7		
Dichlorodifluoromethane	ND	ug/m3	49.4		
Ethylbenzene	ND	ug/m3	21.7		
1,1,2-Trichloro-1,2,2-Trifl		۵5,۶	,		
oethane	ND	ug/m3	38.3		
1,2-Dichloro-1,1,2,2-tetraf					
roethane	ND	ug/m3	34.9		
Hexachlorobutadiene	ND	ug/m3	53.3		
Methylene chloride	ND	ug/m3	34.7		
p/m-Xylene	ND	ug/m3	43.4		
o-Xylene	ND	ug/m3	21.7		
Styrene	ND	ug/m3	21.3		
Tetrachloroethene	ND	ug/m3	33.9		
Toluene	ND	ug/m3	18.8		
trans-1,2-Dichloroethene	ND	ug/m3	19.8		
		~	_,.0		

Comments: Complete list of References and Glossary of Terms found in Addendum I

Laboratory Sample Number: L0603794-01

PRE CARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA' PREP	TE ID ANAL
olatile Organic Compounds i	n Air - ug/	m3 cont'd		48 TO-14A		0325 12:37 PS
rans-1,3-Dichloropropene	ND	ug/m3	22.7			
Crichloroethene	ND	ug/m3	26.8			
richlorofluoromethane	ND	ug/m3	28.1			
inyl chloride	ND	ug/m3	12.8			
4,4-Trimethyl-2-Pentene	276	ug/m3	22.9			
,4,4-Trimethyl-1-Pentene	3760	ug/m3	22.9			
olatile Organic Compounds i	n Air - ppb	V		48 TO-14A		0325 12:37 PS
,1,1-Trichloroethane	ND	Vdqq	5.00			
,1,2,2-Tetrachloroethane	ND	ppbV	5.00			
,1,2-Trichloroethane	ND	ppbV	5.00			
,1-Dichloroethane	ND	ppbV	5.00			
,1-Dichloroethene	ND	ppbV	5.00			
,2,4-Trichlorobenzene	ND	ppbV	5.00			
,2,4-Trimethylbenzene	ND	ppbV	5.00			
,2-Dibromoethane	ND	ppbV	5.00			
,2-Dichlorobenzene	ND	ppbV	5.00			
,2-Dichloroethane	ND	ppbV	5.00			
,2-Dichloropropane	ND	Vdqq	5.00			
,3,5-Trimethylbenzene	ND	Vdqq	5.00			
,3-Dichlorobenzene	ND	ppbV	5.00			
,4-Dichlorobenzene	ND	ppbV	5.00			
enzene	ND	ppbV	5.00			
enzyl chloride	ND	ppbV	5.00			
romomethane	ND	ppbV	5.00			
arbon tetrachloride	ND	ppbV	5.00			
hlorobenzene	ND	ppbV	5.00			
thloroethane	ND	ydgg	5.00			
hloroform	ND	Vdqq	5.00			
hloromethane	ND	Vdqq	5.00			
is-1,2-Dichloroethene	ND	Vdqq	5.00			
is-1,3-Dichloropropene	ND	ppbV	5.00			
ichlorodifluoromethane	ND	ppbV	10.0			
thylbenzene	ND	yddd	5.00			
,1,2-Trichloro-1,2,2-Triflu		ррьч	3.00			
ethane	ND	Vdqq	5.00			
,2-Dichloro-1,1,2,2-tetraf		PPD A	5.00			
oethane	ND	nnh <sup>y</sup>	5.00			
exachlorobutadiene	ND ND	ppbV ppbV	5.00			
ethylene chloride			10.0			
_	ND ND	ppbV	10.0			
/m-Xylene		ppbV				
-Xylene	ND	ppbV	5.00			
tyrene	ND	Vdqq	5.00			
etrachloroethene	ND	ppbV	5.00			
oluene	ND	Vdqq	5.00			
rans-1,2-Dichloroethene	ND	ppbV	5.00			
rans-1,3-Dichloropropene	ND	ppbV	5.00			
richloroethene	ND	ppbV	5.00			
richlorofluoromethane	ND	ppbV	5.00			

Laboratory Sample Number: L0603794-01

PRE CARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds in	n Air - ppbV	cont'd		48 TO-14A	0325 12:37 PS
Vinyl chloride 2,4,4-Trimethyl-2-Pentene 2,4,4-Trimethyl-1-Pentene	ND 60.1 819	ppbV ppbV ppbV	5.00 5.00 5.00		

### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0603794-02 Date Collected: 17-MAR-2006 12:00

Sample Matrix: Date Received: 20-MAR-2006
Date Reported: 27-MAR-2006

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds	in Air - ug/	′m 3		48 TO-14A	0325 11:55 PS
1,1,1-Trichloroethane	ND ND	ug/m3	2.72	46 IU-I4A	0325 II:55 PS
1,1,2,2-Tetrachloroethane	ND	ug/m3	3.43		
1,1,2-Trichloroethane	ND	ug/m3	2.72		
1,1-Dichloroethane	ND	ug/m3	2.02		
1,1-Dichloroethene	ND	ug/m3	1.98		
1,2,4-Trichlorobenzene	ND	ug/m3	3.71		
1,2,4-Trimethylbenzene	ND	ug/m3	2.46		
1,2-Dibromoethane	ND	ug/m3	3.84		
1,2-Dichlorobenzene	ND	ug/m3	3.00		
1,2-Dichloroethane	ND	ug/m3	2.02		
1,2-Dichloropropane	ND	ug/m3	2.31		
1,3,5-Trimethylbenzene	ND	ug/m3	2.46		
1,3-Dichlorobenzene	ND	ug/m3	3.00		
1,4-Dichlorobenzene	ND	ug/m3	3.00		
Benzene	ND	ug/m3	1.60		
Benzyl chloride	ND	ug/m3	2.59		
Bromomethane	ND	ug/m3	1.94		
Carbon tetrachloride	ND	ug/m3	3.14		
Chlorobenzene	ND	ug/m3	2.30		
Chloroethane	ND	ug/m3	1.32		
Chloroform	ND	ug/m3	2.44		
Chloromethane	ND	ug/m3	1.03		
cis-1,2-Dichloroethene	ND	ug/m3	1.98		
cis-1,3-Dichloropropene	ND	ug/m3	2.27		
Dichlorodifluoromethane	ND	ug/m3	4.94		
Ethylbenzene	ND	ug/m3	2.17		
1,1,2-Trichloro-1,2,2-Trifl		49/1113	2.1		
oethane	ND	ug/m3	3.83		
1,2-Dichloro-1,1,2,2-tetraf		۵5,۶	3.03		
roethane	ND	ug/m3	3.49		
Hexachlorobutadiene	ND	ug/m3	5.33		
Methylene chloride	ND	ug/m3	3.47		
p/m-Xylene	ND	ug/m3	4.34		
o-Xylene	ND	ug/m3	2.17		
Styrene	ND	ug/m3	2.13		
Tetrachloroethene	ND	ug/m3	3.39		
Toluene	ND	ug/m3	1.88		
trans-1,2-Dichloroethene	ND	ug/m3	1.98		
crans 1,2 Diditorocciicile	IND	ug/ແນ	1.70		

Comments: Complete list of References and Glossary of Terms found in Addendum I

Laboratory Sample Number: L0603794-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID	
					PREP ANAL	
<i>N</i> olatile Organic Compounds in	a Air - ua/	m3 contid		48 TO-14A	0325 11:55 PS	
trans-1,3-Dichloropropene	ND	ug/m3	2.27	48 10-14A	U325 II·55 PS	
Trichloroethene	ND	ug/m3	2.68			
Trichlorofluoromethane	7.64	ug/m3	2.81			
/inyl chloride	ND	ug/m3	1.28			
2,4,4-Trimethyl-2-Pentene	11.0	ug/m3	2.29			
2,4,4-Trimethyl-1-Pentene	43.7	ug/m3	2.29			
Volatile Organic Compounds in	n Air - ppb	νV		48 TO-14A	0325 11:55 PS	
l,1,1-Trichloroethane	ND	Vdqq	0.500			
,1,2,2-Tetrachloroethane	ND	ppbV	0.500			
.,1,2-Trichloroethane	ND	ppbV	0.500			
,1-Dichloroethane	ND	ppbV	0.500			
,1-Dichloroethene	ND	ppbV	0.500			
,2,4-Trichlorobenzene	ND	ppbV	0.500			
,2,4-Trimethylbenzene	ND	ppbV	0.500			
,2-Dibromoethane	ND	ppbV	0.500			
,2-Dichlorobenzene	ND	Vdqq	0.500			
,2-Dichloroethane	ND	ppbV	0.500			
,2-Dichloropropane	ND	ppbV	0.500			
,3,5-Trimethylbenzene	ND	ppbV	0.500			
,3-Dichlorobenzene	ND	ppbV	0.500			
,4-Dichlorobenzene	ND	ppbV	0.500			
enzene	ND	ppbV	0.500			
enzyl chloride	ND	ppbV	0.500			
romomethane	ND	ppbV	0.500			
arbon tetrachloride	ND	ppbV	0.500			
hlorobenzene	ND	ppbV	0.500			
Chloroethane	ND	ppbV	0.500			
hloroform	ND	ppbV	0.500			
hloromethane	ND	ppbV	0.500			
is-1,2-Dichloroethene	ND	ppbV	0.500			
is-1,3-Dichloropropene	ND	ppbV	0.500			
Dichlorodifluoromethane	ND	ppbV	1.00			
thylbenzene	ND	ppbV	0.500			
.,1,2-Trichloro-1,2,2-Trifluo	or					
ethane	ND	ydqq	0.500			
,2-Dichloro-1,1,2,2-tetraflu	10					
oethane	ND	ydqq	0.500			
exachlorobutadiene	ND	ppbV	0.500			
ethylene chloride	ND	ppbV	1.00			
/m-Xylene	ND	ppbV	1.00			
-Xylene	ND	ppbV	0.500			
tyrene	ND	ppbV	0.500			
'etrachloroethene	ND	ppbV	0.500			
oluene	ND	ppbV	0.500			
rans-1,2-Dichloroethene	ND	ppbV	0.500			
rans-1,3-Dichloropropene	ND	ppbV	0.500			
richloroethene	ND	ppbV	0.500			
richlorofluoromethane	1.36	ppbV	0.500			

Laboratory Sample Number: L0603794-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds in Vinyl chloride 2,4,4-Trimethyl-2-Pentene 2,4,4-Trimethyl-1-Pentene	n Air - ppbV ND 2.40 9.53	cont'd ppbV ppbV ppbV	0.500 0.500 0.500	48 TO-14A	0325 11:55 PS

Laboratory Sample Number: L0603794-02

EFFLUENT

ND

ND

PARAMETER	RESULT	RESULT UNITS		REF METHOD	DATE	ID
					PREP A	NAL
Petroleum Hydrocarbons in Air	s			43 DRAFT 1	0324	1 15:09 PS
Qua	ality Cont	rol Informa	ation			
Sample Type: Sample Container Type: Sampling Flow Controller: Sampling Zone: Sampling Flow Meter RPD of Were all QA/QC procedures REQ Were all performance/acceptar 1. One or more of the APH Were significant modification	Mech Unkn of pre & p OUIRED by nce standa LCS recov	ster - 2.7 anical own ost-samplin the method rds for the eries were	ng calib followe e requir less th	d? ed procedures a an 70%.	achieved?	YES NO NO
mere bigniffeant modified for	ib iliaac co	CITC MICCITON	בקם מט ב	cirica in beet	11.3.	140
C5-C8 Aliphatics	86.2	ug/m3	24.0			
C9-C12 Aliphatics	ND	ug/m3	28.0			
1,3-Butadiene	ND	ug/m3	2.00			
Methyl tert butyl ether	ND	ug/m3	2.00			
Benzene	ND	ug/m3	2.00			
Toluene	3.13	ug/m3	2.00			
Ethylbenzene	ND	ug/m3	2.00			
p/m-Xylene	ND	ug/m3	4.00			
o-Xylene	2.19	ug/m3	2.00			
Naphthalene	ND	ug/m3	2.00			
2-Methylnaphthalene	ND	ug/m3	8.00			
C5-C8 Aliphatics, Adjusted	74.5	ug/m3	24.0			
~~ ~~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~						

ug/m3

ug/m3

28.0

24.0

Comments: Complete list of References and Glossary of Terms found in Addendum I

C9-C12 Aliphatics, Adjusted

C9-C10 Aromatics

Laboratory Job Number: L0603794

Parameter	Value 1	Value 2	Units	RPD	RPD	Limits
Volatile Organic Comp	oounds in Air	for sampl	e(s) 01-02	(L060379	94-01.	WG233840-2)
1,1,1-Trichloroethane	ND	ND	ug/m3	NC	25	,
1,1,2,2-Tetrachloroethane	ND	ND	ug/m3	NC	25	
1,1,2-Trichloroethane	ND	ND	ug/m3	NC	25	
1,1-Dichloroethane	ND	ND	ug/m3	NC	25	
1,1-Dichloroethene	ND	ND	ug/m3	NC	25	
1,2,4-Trichlorobenzene	ND	ND	ug/m3	NC	25	
1,2,4-Trimethylbenzene	ND	ND	ug/m3	NC	25	
1,2-Dibromoethane	ND	ND	ug/m3	NC	25	
1,2-Dichlorobenzene	ND	ND	ug/m3	NC	25	
1,2-Dichloroethane	ND	ND	ug/m3	NC	25	
1,2-Dichloropropane	ND	ND	ug/m3	NC	25	
1,3,5-Trimethylbenzene	ND	ND	ug/m3	NC	25	
1,3-Dichlorobenzene	ND	ND	ug/m3	NC	25	
1,4-Dichlorobenzene	ND	ND	ug/m3	NC	25	
Benzene	ND	ND	ug/m3	NC	25	
Benzyl chloride	ND	ND	ug/m3	NC	25	
Bromomethane	ND	ND	ug/m3	NC	25	
Carbon tetrachloride	ND	ND	ug/m3	NC	25	
Chlorobenzene	ND	ND	ug/m3	NC	25	
Chloroethane	ND	ND	ug/m3	NC	25	
Chloroform	ND	ND	ug/m3	NC	25	
Chloromethane	ND	ND	ug/m3	NC	25	
cis-1,2-Dichloroethene	ND	ND	ug/m3	NC	25	
cis-1,3-Dichloropropene	ND	ND	ug/m3	NC	25	
Dichlorodifluoromethane	ND	ND	ug/m3	NC	25	
Ethylbenzene	ND	ND	ug/m3	NC	25	
1,1,2-Trichloro-1,2,2-Trifluo						
oethane	ND	ND	ug/m3	NC	25	
1,2-Dichloro-1,1,2,2-tetraflu						
roethane	ND	ND	ug/m3	NC	25	
Hexachlorobutadiene	ND	ND	ug/m3	NC	25	
Methylene chloride	ND	ND	ug/m3	NC	25	
p/m-Xylene	ND	ND	ug/m3	NC	25	
o-Xylene	ND	ND	ug/m3	NC	25	
Styrene	ND	ND	ug/m3	NC	25	
Tetrachloroethene	ND	ND	ug/m3	NC	25	
Foluene	ND	ND	ug/m3	NC	25	
trans-1,2-Dichloroethene	ND	ND	ug/m3	NC	25	
trans-1,3-Dichloropropene	ND	ND	ug/m3	NC	25	
Trichloroethene	ND	ND	ug/m3	NC	25	
Trichlorofluoromethane	ND	ND	ug/m3	NC	25	
Vinyl chloride	ND	ND	ug/m3	NC	25	
2,4,4-Trimethyl-2-Pentene	276	280	ug/m3	1	25	
2,4,4-Trimethyl-1-Pentene	3760	3930	ug/m3	4	25	

Laboratory Job Number: L0603794

Parameter	% Recovery	QC Criteria
Volatile Organic Compounds in Air	ICS for sample/	a) 01_02 (WG233840_1)
1,1,1-Trichloroethane	106	70-130
1,1,2,2-Tetrachloroethane	102	70-130
1,1,2-Trichloroethane	128	70-130
1,1-Dichloroethane	64	70-130
	78	
1,1-Dichloroethene	_	70-130
1,2,4-Trichlorobenzene	79	70-130
1,2,4-Trimethylbenzene	102	70-130
1,2-Dibromoethane	95	70-130
1,2-Dichlorobenzene	102	70-130
1,2-Dichloroethane	103	70-130
1,2-Dichloropropane	140	70-130
1,3,5-Trimethylbenzene	98	70-130
1,3-Dichlorobenzene	102	70-130
1,4-Dichlorobenzene	102	70-130
Benzene	119	70-130
Benzyl chloride	91	70-130
Bromomethane	69	70-130
Carbon tetrachloride	109	70-130
Chlorobenzene	99	70-130
Chloroethane	72	70-130
Chloroform	88	70-130
Chloromethane	99	70-130
cis-1,2-Dichloroethene	91	70-130
cis-1,3-Dichloropropene	121	70-130
Dichlorodifluoromethane	80	70-130
Ethylbenzene	103	70-130
1,1,2-Trichloro-1,2,2-Trifluoroethane	70	70-130
1,2-Dichloro-1,1,2,2-tetrafluoroethane	72	70-130
Hexachlorobutadiene	99	70-130
Methylene chloride	79	70-130
p/m-Xylene	102	70-130
o-Xylene	102	70-130
Styrene	86	70-130
Tetrachloroethene	92	70-130
Toluene	104	70-130
trans-1,2-Dichloroethene	71	70-130
trans-1,3-Dichloropropene	101	70-130
Trichloroethene	104	70-130
Trichlorofluoromethane	74	70-130
Vinyl chloride	74	70-130
Petroleum Hydrocarbons in Air I	CS for sample(s	) 02 (WG233886-1)
1,3-Butadiene	94	70-130
Methyl tert butyl ether	71	70-130
Benzene	73	70-130
Toluene	75	70-130
Ethylbenzene	85	70-130
p/m-Xylene	83	70-130
2	55	

Laboratory Job Number: L0603794

Continued

Parameter	% Recovery Q	C Criteria
Petroleum Hydrocarbons in Air LCS	S for sample(s)	02 (WG233886-1)
o-Xylene	86	70-130
Naphthalene	79	70-130
2-Methylnaphthalene	55	70-130
C5-C8 Aliphatics, Adjusted	90	70-130
C9-C12 Aliphatics, Adjusted	70	70-130
C9-C10 Aromatics	76	70-130

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Laboratory Job Number: L0603794

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE I PREP ANAL
Blank Analysi	a for gamr	210(g) 01-0	12 (MC22	2010-21	
olatile Organic Compounds in			12 (WG23.	48 TO-14A	020F 11.14 D
.,1,1-Trichloroethane	ND		2.72	48 TU-14A	0325 11:14 P
.,1,1-111CH1010ethane	ND ND	ug/m3 ug/m3	3.43		
.,1,2-Trichloroethane	ND	ug/m3	2.72		
.,1-Dichloroethane	ND ND	ug/m3	2.02		
.,1-Dichloroethene	ND	ug/m3	1.98		
.,2,4-Trichlorobenzene	ND	ug/m3	3.71		
.,2,4-Trimethylbenzene	ND	ug/m3	2.46		
.,2,4-111Methy1behzehe .,2-Dibromoethane			3.84		
	ND	ug/m3			
.,2-Dichlorobenzene	ND	ug/m3	3.00		
.,2-Dichloroethane	ND	ug/m3	2.02		
,2-Dichloropropane	ND	ug/m3	2.31		
.,3,5-Trimethylbenzene	ND	ug/m3	2.46		
,3-Dichlorobenzene	ND	ug/m3	3.00		
,4-Dichlorobenzene	ND	ug/m3	3.00		
Benzene	ND	ug/m3	1.60		
Benzyl chloride	ND	ug/m3	2.59		
Bromomethane	ND	ug/m3	1.94		
Carbon tetrachloride	ND	ug/m3	3.14		
Chlorobenzene	ND	ug/m3	2.30		
Chloroethane	ND	ug/m3	1.32		
Chloroform	ND	ug/m3	2.44		
Chloromethane	ND	ug/m3	1.03		
cis-1,2-Dichloroethene	ND	ug/m3	1.98		
cis-1,3-Dichloropropene	ND	ug/m3	2.27		
Dichlorodifluoromethane	ND	ug/m3	4.94		
Ithylbenzene	ND	ug/m3	2.17		
.,1,2-Trichloro-1,2,2-Trifluo	or				
ethane	ND	ug/m3	3.83		
.,2-Dichloro-1,1,2,2-tetraflu	10				
roethane	ND	ug/m3	3.49		
Mexachlorobutadiene	ND	ug/m3	5.33		
Methylene chloride	ND	ug/m3	3.47		
o/m-Xylene	ND	ug/m3	4.34		
-Xylene	ND	ug/m3	2.17		
Styrene	ND	ug/m3	2.13		
Tetrachloroethene	ND	ug/m3	3.39		
oluene	ND	ug/m3	1.88		
rans-1,2-Dichloroethene	ND	ug/m3	1.98		
rans-1,3-Dichloropropene	ND	ug/m3	2.27		
Trichloroethene	ND	ug/m3	2.68		
Trichlorofluoromethane	ND	ug/m3	2.81		
inyl chloride	ND	ug/m3	1.28		
	1112	45/1113			
2,4,4-Trimethyl-2-Pentene	ND	ug/m3	2.29		

03270615:43 Page 13 of 16

Laboratory Job Number: L0603794

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE I PREP ANAL
Blank Analys	is for samp	ole(s) 01-0	2 (WG233	8840-3)	
Petroleum Hydrocarbons in Ai			_ (	48 TO-14A	0325 11:14 P
1	11				
Blank Analys	is for samp	ole(s) 01-0	2 (WG233	8840-3)	
Petroleum Hydrocarbons in Ai	r - ppbV			48 TO-14A	0325 11:14 P
1,1,1-Trichloroethane	ND	Vdqq	0.500		
1,1,2,2-Tetrachloroethane	ND	Vdqq	0.500		
1,1,2-Trichloroethane	ND	Vdqq	0.500		
l,1-Dichloroethane	ND	Vdqq	0.500		
1,1-Dichloroethene	ND	Vdqq	0.500		
1,2,4-Trichlorobenzene	ND	ppbV	0.500		
l,2,4-Trimethylbenzene	ND	ppbV	0.500		
1,2-Dibromoethane	ND	ppbV	0.500		
1,2-Dichlorobenzene	ND	ppbV	0.500		
1,2-Dichloroethane	ND	ppbV	0.500		
1,2-Dichloropropane	ND	ppbV	0.500		
1,3,5-Trimethylbenzene	ND	ppbV	0.500		
l,3-Dichlorobenzene	ND	ppbV	0.500		
l,4-Dichlorobenzene	ND	ppbV	0.500		
Benzene	ND	Vdqq	0.500		
Benzyl chloride	ND	ppbV	0.500		
Bromomethane	ND	ppbV	0.500		
Carbon tetrachloride	ND	ppbV	0.500		
Chlorobenzene	ND	ppbv	0.500		
Chloroethane	ND	ppbV	0.500		
Chloroform	ND	ppbv	0.500		
Chloromethane	ND	ppbv	0.500		
cis-1,2-Dichloroethene	ND	ppbV	0.500		
cis-1,3-Dichloropropene	ND	ppbV	0.500		
Dichlorodifluoromethane	ND	ppbV	1.00		
Ethylbenzene	ND	ppbV	0.500		
l,1,2-Trichloro-1,2,2-Triflu		1			
oethane	ND	ppbV	0.500		
1,2-Dichloro-1,1,2,2-tetrafl		_			
roethane	ND	ppbV	0.500		
Hexachlorobutadiene	ND	ppbV	0.500		
Methylene chloride	ND	PpbV	1.00		
o/m-Xylene	ND	Vdqq	1.00		
o-Xylene	ND	Vdqq	0.500		
Styrene	ND	Vdqq	0.500		
Tetrachloroethene	ND	Vdqq	0.500		
Toluene	ND	Vdqq	0.500		
trans-1,2-Dichloroethene	ND	ppbV	0.500		
rans-1,3-Dichloropropene	ND	ppbV	0.500		
Trichloroethene	ND	ppbV	0.500		
Trichlorofluoromethane	ND	Vdqq	0.500		
Vinyl chloride	ND	ppbV	0.500		
2,4,4-Trimethyl-2-Pentene	ND	ppbV	0.500		
2,4,4-Trimethyl-1-Pentene	ND	ppbV	0.500		

Laboratory Job Number: L0603794

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Blank Analy	sis for sa	ample(s)	02 (WG2338	386-3)	
Petroleum Hydrocarbons in Air				43 DRAFT 1	0324 14:05 PS
C5-C8 Aliphatics	ND	ug/m3	24.0		
C9-C12 Aliphatics	ND	ug/m3	28.0		
1,3-Butadiene	ND	ug/m3	2.00		
Methyl tert butyl ether	ND	ug/m3	2.00		
Benzene	ND	ug/m3	2.00		
Toluene	ND	ug/m3	2.00		
Ethylbenzene	ND	ug/m3	2.00		
p/m-Xylene	ND	ug/m3	4.00		
o-Xylene	ND	ug/m3	2.00		
Naphthalene	ND	ug/m3	2.00		
2-Methylnaphthalene	ND	ug/m3	8.00		
C5-C8 Aliphatics, Adjusted	ND	ug/m3	24.0		
C9-C12 Aliphatics, Adjusted	ND	ug/m3	28.0		
C9-C10 Aromatics	ND	ug/m3	24.0		

### ALPHA ANALYTICAL LABORATORIES ADDENDUM I

#### REFERENCES

- 43. Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.
- 48. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

ND Not detected in comparison to the reported detection limit.

NI Not Ignitable.

ug/cart Micrograms per Cartridge.

#### LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

03270615:43 Page 16 of 16

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#### ALPHA ANALYTICAL LABORATORIES

# Eight Walkup Drive Westborough, Massachusetts 01581-1019 (508) 898-9220 www.alphalab.com

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

#### CERTIFICATE OF ANALYSIS

Client: Shaw E&I Laboratory Job Number: L0604781

Address: 100 Technology Center Drive

Stoughton, MA 02072 Date Received: 12-APR-2006

Attn: Mr David Cobb Date Reported: 19-APR-2006

Project Number: 681076 Delivery Method: Alpha

Site: OLIN

ALPHA SAMPLE NUMBER CLIENT IDENTIFICATION SAMPLE LOCATION

L0604781-01 PRECARBON WILMINGTON, MA L0604781-02 EFFLUENT WILMINGTON, MA

Authorized by: M. Maria Technical Representative

04190617:14 Page 1 of 17

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

### ALPHA ANALYTICAL LABORATORIES NARRATIVE REPORT

Laboratory Job Number: L0604781

APH

L0604781-02:

Acetone, Trichloromonofluoromethane, and 2-Butanone are present in the C5-C8 Aliphatic Hydrocarbon range. The responses for these analytes were not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

TO14

Re-analysis on dilution was required in order to quantitate the sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration. The dilution is as follows:

L0604781-01 (10X,25X)

The WG236609-1 LCS has a high % recovery for 1,1,2,2-tetrachloroethane.

-----

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604781-01 Date Collected: 10-APR-2006 11:00

PRECARBON

Date Received: 12-APR-2006

Sample Matrix:

AIR

Date Reported: 19-APR-2006

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID PREP ANAL
Volatile Organic Compounds :	in Air - ug	/m3		48 TO-14A	0419 14:46 PS
1,1,1-Trichloroethane	ND ND	ug/m3	27.2	10 10 1111	0119 111 10 18
1,1,2,2-Tetrachloroethane	ND	ug/m3	34.3		
1,1,2-Trichloroethane	ND	ug/m3	27.2		
1,1-Dichloroethane	ND	ug/m3	20.2		
1,1-Dichloroethene	ND	ug/m3	19.8		
1,2,4-Trichlorobenzene	ND	ug/m3	37.1		
1,2,4-Trimethylbenzene	ND	ug/m3	24.6		
1,2-Dibromoethane	ND	ug/m3	38.4		
1,2-Dichlorobenzene	ND	ug/m3	30.0		
1,2-Dichloroethane	ND	ug/m3	20.2		
1,2-Dichloropropane	ND	ug/m3	23.1		
1,3,5-Trimethylbenzene	ND	ug/m3	24.6		
1,3-Dichlorobenzene	ND	ug/m3	30.0		
1,4-Dichlorobenzene	ND	ug/m3	30.0		
Benzene	ND	ug/m3	16.0		
Benzyl chloride	ND	ug/m3	25.9		
Bromomethane	ND	ug/m3	19.4		
Carbon tetrachloride	ND	ug/m3	31.4		
Chlorobenzene	ND	ug/m3	23.0		
Chloroethane	ND	ug/m3	13.2		
Chloroform	ND	ug/m3	24.4		
Chloromethane	ND	ug/m3	10.3		
cis-1,2-Dichloroethene	ND	ug/m3	19.8		
cis-1,3-Dichloropropene	ND	ug/m3	22.7		
Dichlorodifluoromethane	ND	ug/m3	49.4		
Ethylbenzene	ND	ug/m3	21.7		
1,1,2-Trichloro-1,2,2-Triflu	uor	5,			
oethane	ND	ug/m3	38.3		
1,2-Dichloro-1,1,2,2-tetraf	luo				
roethane	ND	ug/m3	34.9		
Hexachlorobutadiene	ND	ug/m3	53.3		
Methylene chloride	ND	ug/m3	34.7		
p/m-Xylene	ND	ug/m3	43.4		
o-Xylene	ND	ug/m3	21.7		
Styrene	ND	ug/m3	21.3		
Tetrachloroethene	ND	ug/m3	33.9		
Toluene	ND	ug/m3	18.8		
trans-1,2-Dichloroethene	ND	ug/m3	19.8		

Comments: Complete list of References and Glossary of Terms found in Addendum I

Laboratory Sample Number: L0604781-01

PRECARBON

ARAMETER	RESULT	UNITS	$\mathtt{RDL}$	REF METHOD	DA:	re id
					PREP	ANAL
olatile Organic Compounds i	n Air - wa	/m3 cont'd		48 TO-14A		0419 14:46 PS
rans-1,3-Dichloropropene	ND	ug/m3	22.7	10 10 1111		0113 11 10 15
richloroethene	ND	ug/m3	26.8			
richlorofluoromethane	ND	ug/m3	28.1			
inyl chloride	ND	ug/m3	12.8			
4,4-Trimethyl-2-Pentene	960	ug/m3	22.9			
,4,4-Trimethyl-1-Pentene	>4600	ug/m3	22.9			
olatile Organic Compounds i	n Air - ug	/m3		48 TO-14A		0419 16:01 PS
,4,4-Trimethyl-1-Pentene	5560	ug/m3	57.3			
olatile Organic Compounds i	n Air - ppl	bV		48 TO-14A		0419 14:46 PS
,1,1-Trichloroethane	ND	ppbV	5.00			
,1,2,2-Tetrachloroethane	ND	ppbV	5.00			
,1,2-Trichloroethane	ND	ppbV	5.00			
,1-Dichloroethane	ND	ppbV	5.00			
,1-Dichloroethene	ND	ppbV	5.00			
,2,4-Trichlorobenzene	ND	ppbV	5.00			
,2,4-Trimethylbenzene	ND	ppbV	5.00			
,2-Dibromoethane	ND	ppbV	5.00			
,2-Dichlorobenzene	ND	Vdqq	5.00			
,2-Dichloroethane	ND	ppbV	5.00			
,2-Dichloropropane	ND	ppbV	5.00			
,3,5-Trimethylbenzene	ND	ppbV	5.00			
,3-Dichlorobenzene	ND	ppbV	5.00			
,4-Dichlorobenzene	ND	ppbV	5.00			
enzene	ND	ppbV	5.00			
enzyl chloride	ND	ppbV	5.00			
gromomethane	ND	ppbV	5.00			
arbon tetrachloride	ND	ppbV	5.00			
thlorobenzene	ND	Vdqq	5.00			
thloroethane	ND	ppbV	5.00			
hloroform	ND	ppbV	5.00			
thloromethane	ND	ppbV	5.00			
is-1,2-Dichloroethene	ND	ppbV	5.00			
sis-1,3-Dichloropropene	ND	ppbV	5.00			
oichlorodifluoromethane	ND	ppbV	10.0			
thylbenzene	ND	ppbV	5.00			
.,1,2-Trichloro-1,2,2-Triflu		PP~ 1	3.00			
ethane	ND	yddd	5.00			
.,2-Dichloro-1,1,2,2-tetrafl		F F ~ .				
oethane	ND	yddd	5.00			
exachlorobutadiene	ND	ppbV	5.00			
ethylene chloride	ND	ppbV	10.0			
/m-Xylene	ND	ppbV	10.0			
-Xylene	ND	ppbv Vdqq	5.00			
tyrene	ND	ppbv Vdqq	5.00			
	ND ND	ppbv	5.00			
etrachloroethere						
'etrachloroethene 'oluene	ND	ppbV	5.00			

 $\hbox{{\tt Comments:}} \ \hbox{{\tt Complete list of References and Glossary of Terms found in Addendum I} \\$ 

Laboratory Sample Number: L0604781-01

PRECARBON

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID
					PREP ANAL
Volatile Organic Compounds i	n Air - ppbV	cont'd		48 TO-14A	0419 14:46 PS
trans-1,3-Dichloropropene	ND	Vdqq	5.00		
Trichloroethene	ND	Vdqq	5.00		
Trichlorofluoromethane	ND	Vdqq	5.00		
Vinyl chloride	ND	Vdqq	5.00		
2,4,4-Trimethyl-2-Pentene	209	ppbV	5.00		
2,4,4-Trimethyl-1-Pentene	>1000	ppbV	5		
Volatile Organic Compounds i	n Air - ppbV			48 TO-14A	0419 16:01 PS
2,4,4-Trimethyl-1-Pentene	1210	Vdqq	12.5		

 $\hbox{{\tt Comments:}} \ \hbox{{\tt Complete list of References and Glossary of Terms found in Addendum I} \\$ 

#### MA:M-MA086 NH:200301-A CT:PH-0574 ME:MA086 RI:65 NY:11148 NJ:MA935 Army:USACE

Laboratory Sample Number: L0604781-02 Date Collected: 10-APR-2006 11:15

Sample Matrix: Date Received: 12-APR-2006
Date Reported: 19-APR-2006

Condition of Sample: Satisfactory Field Prep: None

Number & Type of Containers: 1-Can

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE ID
					PREP ANAL
Volatile Organic Compounds i	n Air - ug,	/m3		48 TO-14A	0419 14:11 PS
1,1,1-Trichloroethane	ND	ug/m3	2.72		
1,1,2,2-Tetrachloroethane	ND	ug/m3	3.43		
1,1,2-Trichloroethane	ND	ug/m3	2.72		
1,1-Dichloroethane	ND	ug/m3	2.02		
1,1-Dichloroethene	ND	ug/m3	1.98		
1,2,4-Trichlorobenzene	ND	ug/m3	3.71		
1,2,4-Trimethylbenzene	ND	ug/m3	2.46		
1,2-Dibromoethane	ND	ug/m3	3.84		
1,2-Dichlorobenzene	ND	ug/m3	3.00		
1,2-Dichloroethane	ND	ug/m3	2.02		
1,2-Dichloropropane	ND	ug/m3	2.31		
1,3,5-Trimethylbenzene	ND	ug/m3	2.46		
1,3-Dichlorobenzene	ND	ug/m3	3.00		
1,4-Dichlorobenzene	ND	ug/m3	3.00		
Benzene	ND	ug/m3	1.60		
Benzyl chloride	ND	ug/m3	2.59		
Bromomethane	ND	ug/m3	1.94		
Carbon tetrachloride	ND	ug/m3	3.14		
Chlorobenzene	ND	ug/m3	2.30		
Chloroethane	ND	ug/m3	1.32		
Chloroform	ND	ug/m3	2.44		
Chloromethane	ND	ug/m3	1.03		
cis-1,2-Dichloroethene	ND	ug/m3	1.98		
cis-1,3-Dichloropropene	ND	ug/m3	2.27		
Dichlorodifluoromethane	ND	ug/m3	4.94		
Ethylbenzene	ND	ug/m3	2.17		
1,1,2-Trichloro-1,2,2-Triflu	or				
oethane	ND	ug/m3	3.83		
1,2-Dichloro-1,1,2,2-tetrafl	uo				
roethane	ND	ug/m3	3.49		
Hexachlorobutadiene	ND	ug/m3	5.33		
Methylene chloride	ND	ug/m3	3.47		
p/m-Xylene	ND	ug/m3	4.34		
o-Xylene	ND	ug/m3	2.17		
Styrene	ND	ug/m3	2.13		
Tetrachloroethene	ND	ug/m3	3.39		
Toluene	3.17	ug/m3	1.88		
trans-1,2-Dichloroethene	ND	ug/m3	1.98		

Comments: Complete list of References and Glossary of Terms found in Addendum I

Laboratory Sample Number: L0604781-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DA		ID
					PREP	ANAL	
Volatile Organic Compounds i	ln Air - ug	/m3 cont'd		48 TO-14A		0419 14:	11 PS
trans-1,3-Dichloropropene	ND	ug/m3	2.27				
Trichloroethene	ND	ug/m3	2.68				
Trichlorofluoromethane	9.18	ug/m3	2.81				
Vinyl chloride	ND	ug/m3	1.28				
2,4,4-Trimethyl-2-Pentene	236	ug/m3	2.29				
2,4,4-Trimethyl-1-Pentene	536	ug/m3	2.29				
Volatile Organic Compounds i	ln Air - ppl	bV		48 TO-14A		0419 14:	11 PS
1,1,1-Trichloroethane	ND	Vdqq	0.500				
1,1,2,2-Tetrachloroethane	ND	Vdqq	0.500				
1,1,2-Trichloroethane	ND	Vdqq	0.500				
1,1-Dichloroethane	ND	Vdqq	0.500				
1,1-Dichloroethene	ND	ppbV	0.500				
1,2,4-Trichlorobenzene	ND	ppbV	0.500				
1,2,4-Trimethylbenzene	ND	ppbV	0.500				
1,2-Dibromoethane	ND	ppbV	0.500				
1,2-Dichlorobenzene	ND	ppbV	0.500				
1,2-Dichloroethane	ND	ppbV	0.500				
1,2-Dichloropropane	ND	ppbV	0.500				
1,3,5-Trimethylbenzene	ND	ppbV	0.500				
1,3-Dichlorobenzene	ND	ppbV	0.500				
1,4-Dichlorobenzene	ND	ppbV	0.500				
Benzene	ND	ppbV	0.500				
Benzyl chloride	ND	ppbV	0.500				
Bromomethane	ND	ppbV	0.500				
Carbon tetrachloride	ND	ppbV	0.500				
Chlorobenzene	ND	ppbV	0.500				
Chloroethane	ND	ppbV	0.500				
Chloroform	ND	ppbV	0.500				
Chloromethane	ND	ppbV	0.500				
cis-1,2-Dichloroethene	ND	ppbV	0.500				
cis-1,3-Dichloropropene	ND	ppbV	0.500				
Dichlorodifluoromethane	ND	ppbV	1.00				
Ethylbenzene	ND	ppbV	0.500				
1,1,2-Trichloro-1,2,2-Triflu		F F -2 *					
oethane	ND	ydqq	0.500				
1,2-Dichloro-1,1,2,2-tetrafl		FF~.	3.300				
roethane	ND	Vdqq	0.500				
Hexachlorobutadiene	ND	ppbV	0.500				
Methylene chloride	ND	Vdqq	1.00				
p/m-Xylene	ND	ppbV	1.00				
o-Xylene	ND	yddd	0.500				
Styrene	ND	yddd	0.500				
Styrene Tetrachloroethene	ND ND	yddd	0.500				
retrachioroethene Toluene	0.841	Vdqq	0.500				
trans-1,2-Dichloroethene	0.841 ND	Vdqq	0.500				
trans-1,3-Dichloropropene Trichloroethene	ND	ppbV	0.500				
	ND	Vdqq	0.500				
Trichlorofluoromethane	1.63	Vdqq	0.500				

 $\hbox{{\tt Comments:}} \ \hbox{{\tt Complete list of References and Glossary of Terms found in Addendum I} \\$ 

Laboratory Sample Number: L0604781-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE :	ID
Volatile Organic Compounds in Vinyl chloride 2,4,4-Trimethyl-2-Pentene 2,4,4-Trimethyl-1-Pentene	Air - ppbV ND 51.5 117	cont'd ppbV ppbV ppbV	0.500 0.500 0.500	48 TO-14A	0419 14:11	PS

 $\hbox{{\tt Comments:}} \ \hbox{{\tt Complete list of References and Glossary of Terms found in Addendum I} \\$ 

Laboratory Sample Number: L0604781-02

EFFLUENT

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE	ID
					PREP ANAL	

Petroleum Hydrocarbons in Air

43 DRAFT 1

0418 18:06 PS

Quality Control Information

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical Sampling Zone: Unknown

Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%

Were all QA/QC procedures REQUIRED by the method followed?

Were all performance/acceptance standards for the required procedures achieved?

Were significant modifications made to the method as specified in Sect 11.3?

NO

C5-C8 Aliphatics	877	ug/m3	24.0
C9-C12 Aliphatics	32.1	ug/m3	28.0
1,3-Butadiene	ND	ug/m3	2.00
Methyl tert butyl ether	ND	ug/m3	2.00
Benzene	ND	ug/m3	2.00
Toluene	6.64	ug/m3	2.00
Ethylbenzene	ND	ug/m3	2.00
p/m-Xylene	ND	ug/m3	4.00
o-Xylene	ND	ug/m3	2.00
Naphthalene	ND	ug/m3	2.00
2-Methylnaphthalene	ND	ug/m3	8.00
C5-C8 Aliphatics, Adjusted	870	ug/m3	24.0
C9-C12 Aliphatics, Adjusted	30.8	ug/m3	28.0
C9-C10 Aromatics	ND	ug/m3	24.0

Comments: Complete list of References and Glossary of Terms found in Addendum I

Laboratory Job Number: L0604781

Parameter	Value 1	Value 2	Units	RPD	RPD	Limits
Volatile Organic Comp	oounds in Air	for sampl	e(a) N1-N2	(T.060478	81 – 01	WC236609-2)
1,1,1-Trichloroethane	ND	ND	uq/m3	NC	25	WG230009-2)
1,1,2,2-Tetrachloroethane	ND	ND	ug/m3	NC	25	
1,1,2-Trichloroethane	ND	ND	ug/m3	NC	25	
1,1-Dichloroethane	ND	ND	ug/m3	NC	25	
1,1-Dichloroethene	ND	ND	ug/m3	NC	25	
1,2,4-Trichlorobenzene	ND	ND	ug/m3	NC	25	
1,2,4-Trimethylbenzene	ND	ND	ug/m3	NC	25	
1,2-Dibromoethane	ND	ND	ug/m3	NC	25	
1,2-Dichlorobenzene	ND	ND	ug/m3	NC	25	
1,2-Dichloroethane	ND	ND	ug/m3	NC	25	
1,2-Dichloropropane	ND	ND	ug/m3	NC	25	
1,3,5-Trimethylbenzene	ND	ND	ug/m3	NC	25	
1,3-Dichlorobenzene	ND	ND	ug/m3	NC	25	
1,4-Dichlorobenzene	ND ND	ND	ug/m3	NC	25	
Benzene	ND ND	ND	ug/m3	NC	25	
Benzene Benzyl chloride	ND ND	ND	ug/m3	NC	25 25	
Bromomethane	ND	ND	ug/m3	NC	25	
Carbon tetrachloride	ND	ND	ug/m3	NC	25	
Chlorobenzene	ND ND	ND	ug/m3	NC	25	
Chloroethane	ND	ND	ug/m3	NC	25	
Chloroform	ND ND	ND	ug/m3	NC	25	
Chloromethane	ND	ND	ug/m3	NC	25	
cis-1,2-Dichloroethene	ND	ND	ug/m3	NC	25	
cis-1,3-Dichloropropene	ND ND	ND	ug/m3	NC	25	
Dichlorodifluoromethane	ND ND	ND	ug/m3	NC	25	
Ethylbenzene	ND ND	ND	ug/m3	NC	25 25	
tilyibenzene L,1,2-Trichloro-1,2,2-Trifluo		ND	ug/ili3	INC	23	
pethane	ND	ND	110 /m2	NC	25	
bethane 1,2-Dichloro-1,1,2,2-tetraflı		אזע	ug/m3	INC	<b>4</b> 5	
roethane		MD	ug/m3	NC	25	
roetnane Hexachlorobutadiene	ND ND	ND ND	_	NC NC	25 25	
Methylene chloride			ug/m3 ug/m3		25 25	
<del>-</del>	ND ND	ND ND	ug/m3 ug/m3	NC NC	25 25	
o/m-Xylene	ND ND	ND ND	_	NC	25 25	
o-Xylene			ug/m3			
Styrene Tetrachloroethene	ND ND	ND	ug/m3 ug/m3	NC NC	25 25	
retrachioroethene Foluene		ND	_		25 25	
	ND	ND	ug/m3	NC NC		
trans-1,2-Dichloroethene	ND	ND	ug/m3	NC NC	25 25	
crans-1,3-Dichloropropene Frichloroethene	ND	ND	ug/m3	NC NC		
	ND	ND	ug/m3	NC NC	25 25	
Trichlorofluoromethane	ND	ND	ug/m3	NC	25	
Vinyl chloride	ND	ND	ug/m3	NC	25	
2,4,4-Trimethyl-2-Pentene	960	870	ug/m3	10	25	
2,4,4-Trimethyl-1-Pentene	5560	6370	ug/m3	11	25	

Laboratory Job Number: L0604781

Continued

Parameter	Value 1	Value 2	Units	RPD	RPD Limits
Petroleum Hydroca	rbons in Air	for sample	e(s) 02 (	(L0605197-01	L, WG236544-2)
C5-C8 Aliphatics	211	205	ug/m3	3	30
C9-C12 Aliphatics	ND	ND	ug/m3	NC	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	22.7	28.8	ug/m3	24	30
Benzene	8.98	8.47	ug/m3	6	30
Toluene	40.1	39.3	ug/m3	2	30
Ethylbenzene	5.82	4.76	ug/m3	20	30
p/m-Xylene	13.4	11.3	ug/m3	17	30
o-Xylene	ND	ND	ug/m3	NC	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	118	111	ug/m3	6	30
C9-C12 Aliphatics, Adjusted	ND	ND	ug/m3	NC	30
C9-C10 Aromatics	ND	ND	ug/m3	NC	30

04190617:14 Page 11 of 17

Laboratory Job Number: L0604781

Parameter	% Recovery (	QC Criteria
		\ 01 00 (\text{\tinx{\tinit}\\ \text{\tin\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tin\tin\text{\ticl{\text{\text{\text{\text{\text{\text{\text{\text{\text{\tin\ticl{\tinit}\\ \tint\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\text{\texi}\text{\text{\texi}\tint{\text{\text{\tin\tinit}\text{\text{\text{\text{\texi\tinit}\\ \tinithtt{\text{\texi}\tint{\text{\ti}\tinttit{\text{\tinit}\tint{\text{\ti}\tit
Volatile Organic Compounds in Air LC		
1,1,1-Trichloroethane	94	70-130
1,1,2,2-Tetrachloroethane	149	70-130
1,1,2-Trichloroethane	120	70-130
1,1-Dichloroethane	89	70-130
1,1-Dichloroethene	105	70-130
1,2,4-Trichlorobenzene	75	70-130
1,2,4-Trimethylbenzene	130	70-130
1,2-Dibromoethane	108	70-130
1,2-Dichlorobenzene	115	70-130
1,2-Dichloroethane	107	70-130
1,2-Dichloropropane	128	70-130
1,3,5-Trimethylbenzene	123	70-130
1,3-Dichlorobenzene	118	70-130
1,4-Dichlorobenzene	115	70-130
Benzene	107	70-130
Benzyl chloride	114	70-130
Bromomethane	109	70-130
Carbon tetrachloride	87	70-130
Chlorobenzene	116	70-130
Chloroethane	116	70-130
Chloroform	118	70-130
Chloromethane	119	70-130
cis-1,2-Dichloroethene	93	70-130
cis-1,3-Dichloropropene	103	70-130
Dichlorodifluoromethane	110	70-130
Ethylbenzene	124	70-130
1,1,2-Trichloro-1,2,2-Trifluoroethane	103	70-130
1,2-Dichloro-1,1,2,2-tetrafluoroethane	108	70-130
Hexachlorobutadiene	104	70-130
Methylene chloride	117	70-130
p/m-Xylene	128	70-130
o-Xylene	130	70-130
Styrene	108	70-130
Tetrachloroethene	86	70-130
Toluene	120	70-130
trans-1,2-Dichloroethene	88	70-130
trans-1,3-Dichloropropene	84	70-130
Trichloroethene	89	70-130
Trichlorofluoromethane	99	70-130
Vinyl chloride	111	70-130
vinyi chioriae	111	70-130
Petroleum Hydrocarbons in Air LCS	for sample(s)	) 02 (WG236544-1)
1,3-Butadiene	93	70-130
Methyl tert butyl ether	79	70-130
Benzene	81	70-130
Toluene	91	70-130
Ethylbenzene	113	70-130
p/m-Xylene	115	70-130

Laboratory Job Number: L0604781

Continued

Parameter	% Recovery QC Criteria	
Petroleum Hydrocarbons in Air LCS	for sample(s) 02 (WG236544-1)	
o-Xylene	117 70-130	
Naphthalene	130 70-130	
2-Methylnaphthalene	84 70-130	
C5-C8 Aliphatics, Adjusted	79 70-130	
C9-C12 Aliphatics, Adjusted	102 70-130	
C9-C10 Aromatics	117 70-130	

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Laboratory Job Number: L0604781

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE II PREP ANAL
Blank Analys			)2 (WG23	6609-3)	
Volatile Organic Compounds :	in Air - ug,	/m3		48 TO-14A	0419 11:03 PS
l,1,1-Trichloroethane	ND	ug/m3	2.72		
l,1,2,2-Tetrachloroethane	ND	ug/m3	3.43		
l,1,2-Trichloroethane	ND	ug/m3	2.72		
l,1-Dichloroethane	ND	ug/m3	2.02		
l,1-Dichloroethene	ND	ug/m3	1.98		
.,2,4-Trichlorobenzene	ND	ug/m3	3.71		
l,2,4-Trimethylbenzene	ND	ug/m3	2.46		
1,2-Dibromoethane	ND	ug/m3	3.84		
l,2-Dichlorobenzene	ND	ug/m3	3.00		
l,2-Dichloroethane	ND	ug/m3	2.02		
l,2-Dichloropropane	ND	ug/m3	2.31		
l,3,5-Trimethylbenzene	ND	ug/m3	2.46		
l,3-Dichlorobenzene	ND	ug/m3	3.00		
l,4-Dichlorobenzene	ND	ug/m3	3.00		
Benzene	ND	ug/m3	1.60		
Benzyl chloride	ND	ug/m3	2.59		
Bromomethane	ND	ug/m3	1.94		
Carbon tetrachloride	ND	ug/m3	3.14		
Chlorobenzene	ND	ug/m3	2.30		
Chloroethane	ND	ug/m3	1.32		
Chloroform	ND	ug/m3	2.44		
Chloromethane	ND	ug/m3	1.03		
cis-1,2-Dichloroethene	ND	ug/m3	1.98		
cis-1,3-Dichloropropene	ND	ug/m3	2.27		
Dichlorodifluoromethane	ND	ug/m3	4.94		
Ethylbenzene	ND	ug/m3	2.17		
.,1,2-Trichloro-1,2,2-Triflu	ıor				
oethane	ND	ug/m3	3.83		
1,2-Dichloro-1,1,2,2-tetraf	luo	_			
coethane	ND	ug/m3	3.49		
Hexachlorobutadiene	ND	ug/m3	5.33		
Methylene chloride	ND	ug/m3	3.47		
p/m-Xylene	ND	ug/m3	4.34		
o-Xylene	ND	ug/m3	2.17		
Styrene	ND	ug/m3	2.13		
Tetrachloroethene	ND	ug/m3	3.39		
Coluene	ND	ug/m3	1.88		
crans-1,2-Dichloroethene	ND	ug/m3	1.98		
crans-1,3-Dichloropropene	ND	ug/m3	2.27		
Trichloroethene	ND	ug/m3	2.68		
Trichlorofluoromethane	ND	ug/m3	2.81		
Vinyl chloride	ND	ug/m3	1.28		
2,4,4-Trimethyl-2-Pentene	ND	ug/m3	2.29		
2,4,4 Trimethyl-1-Pentene	ND	ug/m3	2.29		

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Laboratory Job Number: L0604781

Continued

PARAMETER	RESULT	UNITS	RDL	REF METHOD	DATE I PREP ANAL
				····	FREF ANAL
Blank Analys	sis for sam	ole(s) 01-0	2 (WG236	(609–3)	
Petroleum Hydrocarbons in Ai			2 (110230	48 TO-14A	0419 11:03 F
51 1 2 1		7 ( ) 01 0	0 /770000		
Blank Analys Petroleum Hydrocarbons in Ai		ple(s) 01-0	2 (WG236	609-3) 48 TO-14A	0419 11:03 F
1,1,1-Trichloroethane	ND	Vdqq	0.500	10 10 1111	0113 11 03 1
1,1,2,2-Tetrachloroethane	ND	ppbV	0.500		
1,1,2-Trichloroethane	ND	ppbV	0.500		
1,1-Dichloroethane	ND	ppbV	0.500		
1,1-Dichloroethene	ND	ppbV	0.500		
1,2,4-Trichlorobenzene	ND	Vdqq	0.500		
1,2,4 Trienfolobenzene	ND	yddd	0.500		
1,2-Dibromoethane	ND	ydqq	0.500		
1,2-Dibromoethane 1,2-Dichlorobenzene	ND	ppbv	0.500		
1,2-Dichloroethane	ND ND	ppbv	0.500		
1,2-Dichloropropane	ND	ppbv	0.500		
1,3,5-Trimethylbenzene	ND	ppbv	0.500		
1,3-Dichlorobenzene	ND	ppbv	0.500		
1,4-Dichlorobenzene	ND	Vdqq	0.500		
Benzene	ND ND	Vdqq	0.500		
Benzyl chloride	ND		0.500		
Bromomethane	ND ND	ppbV ppbV	0.500		
Carbon tetrachloride	ND		0.500		
Chlorobenzene	ND ND	ppbV	0.500		
Chloroethane		ppbV			
Chloroform	ND	ppbV	0.500		
	ND	ppbV	0.500		
Chloromethane	ND	ppbV	0.500		
cis-1,2-Dichloroethene	ND	ppbV	0.500		
cis-1,3-Dichloropropene	ND	ppbV	0.500		
Dichlorodifluoromethane	ND	ppbV	1.00		
Ethylbenzene	ND	ppbV	0.500		
l,1,2-Trichloro-1,2,2-Triflu		1			
oethane	ND	ppbV	0.500		
1,2-Dichloro-1,1,2,2-tetraf		1			
roethane	ND	ppbV	0.500		
Hexachlorobutadiene	ND	ppbV	0.500		
Methylene chloride	ND	Vdqq	1.00		
p/m-Xylene	ND	Vdqq	1.00		
o-Xylene	ND	ppbV	0.500		
Styrene	ND	Vdqq	0.500		
Tetrachloroethene	ND	Vdqq	0.500		
Toluene	ND	Vdqq	0.500		
trans-1,2-Dichloroethene	ND	Vdqq	0.500		
trans-1,3-Dichloropropene	ND	ppbV	0.500		
Trichloroethene	ND	ppbV	0.500		
Trichlorofluoromethane	ND	ppbV	0.500		
Vinyl chloride	ND	ppbV	0.500		
2,4,4-Trimethyl-2-Pentene	ND	Vdqq	0.500		
2,4,4-Trimethyl-1-Pentene	ND	ppbV	0.500		

Laboratory Job Number: L0604781

Continued

PARAMETER	RESULT	UNITS		RDL	REF	METHOD	DA	TE	ID
							PREP	ANAL	
Blank Anal	ysis for	sample(s)	02	(WG236	544-3				
Petroleum Hydrocarbons in Ai	r				43	DRAFT 1		0419 05:3	5 PS
C5-C8 Aliphatics	ND	ug/m3		24.0					
C9-C12 Aliphatics	ND	ug/m3		28.0					
1,3-Butadiene	ND	ug/m3		2.00					
Methyl tert butyl ether	ND	ug/m3		2.00					
Benzene	ND	ug/m3		2.00					
Toluene	ND	ug/m3		2.00					
Ethylbenzene	ND	ug/m3		2.00					
p/m-Xylene	ND	ug/m3		4.00					
o-Xylene	ND	ug/m3		2.00					
Naphthalene	ND	ug/m3		2.00					
2-Methylnaphthalene	ND	ug/m3		8.00					
C5-C8 Aliphatics, Adjusted	ND	ug/m3		24.0					
C9-C12 Aliphatics, Adjusted	ND	ug/m3		28.0					
C9-C10 Aromatics	ND	ug/m3		24.0					

04190617:14 Page 16 of 17

### ALPHA ANALYTICAL LABORATORIES ADDENDUM I

#### REFERENCES

- 43. Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.
- 48. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### GLOSSARY OF TERMS AND SYMBOLS

REF Reference number in which test method may be found.

METHOD Method number by which analysis was performed.

ID Initials of the analyst.

ND Not detected in comparison to the reported detection limit.

NI Not Ignitable.

ug/cart Micrograms per Cartridge.

#### LIMITATION OF LIABILITIES

Alpha Analytical, Inc. performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical, Inc., shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical, Inc. be held liable for any incidental consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical, Inc.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding times and splitting of samples in the field.

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04190617:14 Page 17 of 17

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#### ANALYTICAL REPORT

Lab Number: L0607483

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 06/06/06



 Project Name:
 OLIN
 Lab Number:
 L0607483

 Project Number:
 681076
 Report Date:
 06/06/06

Alpha Sample IDClient IDSample LocationL0607483-01PRE CARBONWILMINGTON, MAL0607483-02EFFLUENTWILMINGTON, MA

 Project Name:
 OLIN
 Lab Number:
 L0607483

 Project Number:
 681076
 Report Date:
 06/06/06

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise note below.

#### TO14

Organic Compounds in Air

In order to comply with various regulatory requirements, the results for the analysis of Organic Compounds in Air by EPA TO-14A or TO-15 are provided in ug/m3 as well as ppbv for each sample in a sequential format. L0607483-01 has elevated limits of detection due to the 10x dilutions required by the elevated concentrations of target compounds in the sample.

The WG241298-1 LCS has a high recovery for 1,2-dichloropropane, and a low recovery for 1,2,4-trichlorobenzene.

**APH** 

L0607483-02:

Acetone, a Siloxane isomer, methylene chloride and trichlorofluoromethane are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director

Date: 06/06/06



# **AIR**



Project Number: CS4076 Lab Number: L0607483

Project Number: 681076 Report Date: 06/06/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: 05/26/06 10:30

Client ID: PRE CARBON Date Received: 05/30/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 06/01/06 00:48

Analyst: PS

	ppb\	<u>/</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	5.00	ND	27.2		10
1,1,2,2-Tetrachloroethane	ND	5.00	ND	34.3		10
1,1,2-Trichloroethane	ND	5.00	ND	27.2		10
1,1-Dichloroethane	ND	5.00	ND	20.2		10
1,1-Dichloroethene	ND	5.00	ND	19.8		10
1,2,4-Trichlorobenzene	ND	5.00	ND	37.1		10
1,2,4-Trimethylbenzene	ND	5.00	ND	24.6		10
1,2-Dibromoethane	ND	5.00	ND	38.4		10
1,2-Dichlorobenzene	ND	5.00	ND	30.0		10
1,2-Dichloroethane	ND	5.00	ND	20.2		10
1,2-Dichloropropane	ND	5.00	ND	23.1		10
1,3,5-Trimethylbenzene	ND	5.00	ND	24.6		10
1,3-Dichlorobenzene	ND	5.00	ND	30.0		10
1,4-Dichlorobenzene	ND	5.00	ND	30.0		10
Benzene	ND	5.00	ND	16.0		10
Benzyl chloride	ND	5.00	ND	25.9		10
Bromomethane	ND	5.00	ND	19.4		10
Carbon tetrachloride	ND	5.00	ND	31.4		10
Chlorobenzene	ND	5.00	ND	23.0		10
Chloroethane	ND	5.00	ND	13.2		10
Chloroform	8.05	5.00	39.3	24.4		10
Chloromethane	ND	5.00	ND	10.3		10
cis-1,2-Dichloroethene	ND	5.00	ND	19.8		10
cis-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Dichlorodifluoromethane	ND	10.0	ND	49.4		10



Project Number: C04076 Lab Number: L0607483

Project Number: 681076 Report Date: 06/06/06

#### **SAMPLE RESULTS**

Lab ID:L0607483-01Date Collected:05/26/06 10:30Client ID:PRE CARBONDate Received:05/30/06Sample Location:WILMINGTON, MAField Prep:Not Specified

ppbV ug/m3 **Dilution Factor Parameter** Results **RDL** Results **RDL** Qualifier Volatile Organic Compounds in Air Ethylbenzene ND 5.00 ND 21.7 10 1,1,2-Trichloro-1,2,2-Trifluoroethane ND 5.00 ND 38.3 10 1,2-Dichloro-1,1,2,2-tetrafluoroethane ND 5.00 ND 34.9 10 Hexachlorobutadiene ND 5.00 ND 53.3 10 Methylene chloride ND 10.0 ND 34.7 10 p/m-Xylene ND10.0 ND 43.4 10 o-Xylene ND 5.00 ND 21.7 10 Styrene ND 5.00 ND 21.3 10 Tetrachloroethene 14.9 5.00 101 33.9 10 Toluene ND5.00 ND 18.8 10 trans-1,2-Dichloroethene 5.00 ND 19.8 ND10 trans-1,3-Dichloropropene ND 5.00 ND 22.7 10 Trichloroethene ND 5.00 ND 26.8 10 Trichlorofluoromethane ND 5.00 ND 28.1 10 Vinyl bromide ND5.00 ND 21.8 10 Vinyl chloride 5.00 ND ND 12.8 10 2,4,4-Trimethyl-2-Pentene 15.7 5.00 71.9 22.9 10 2,4,4-Trimethyl-1-Pentene 299 5.00 1370 22.9 10



Project Name: OLIN Lab Number: L0607483

Project Number: 681076 Report Date: 06/06/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: 05/26/06 10:31

Client ID: EFFLUENT Date Received: 05/30/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 05/31/06 20:11

Analyst: PS

Parameter         Results         RDL         Results         RDL         Qualifier           Volatile Organic Compounds in Air         1.1,1-Trichloroethane         ND         0.500         ND         2.72           1,1,2-Tetrachloroethane         ND         0.500         ND         3.43           1,1,2-Trichloroethane         ND         0.500         ND         2.72           1,1-Dichloroethane         ND         0.500         ND         2.02           1,1-Dichloroethane         ND         0.500         ND         1.98           1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2-Trimethylbenzene         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         3.00	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1,1,1-Trichloroethane       ND       0,500       ND       2.72         1,1,2,2-Tetrachloroethane       ND       0,500       ND       3,43         1,1,2-Trichloroethane       ND       0,500       ND       2,72         1,1-Dichloroethane       ND       0,500       ND       2,02         1,1-Dichloroethene       ND       0,500       ND       1,98         1,2,4-Trichlorobenzene       ND       0,500       ND       3,71         1,2,4-Trimethylbenzene       ND       0,500       ND       2,46         1,2-Dichromoethane       ND       0,500       ND       3,84         1,2-Dichlorobenzene       ND       0,500       ND       3,00         1,2-Dichloroethane       ND       0,500       ND       2,02         1,2-Dichloropropane       ND       0,500       ND       2,31         1,3-5-Trimethylbenzene       ND       0,500       ND       3,00         1,4-Dichlorobenzene       ND       0,500       ND       3,00         Benzene       ND       0,500       ND       3,00         Benzene       ND       0,500       ND       2,59         Bromomethane       ND       0,500	1 1 1
1,1,2,2-Tetrachloroethane       ND       0,500       ND       3,43         1,1,2-Trichloroethane       ND       0,500       ND       2,72         1,1-Dichloroethane       ND       0,500       ND       2,02         1,1-Dichloroethene       ND       0,500       ND       1,98         1,2,4-Trichlorobenzene       ND       0,500       ND       3,71         1,2,4-Trimethylbenzene       ND       0,500       ND       2,46         1,2-Dibromoethane       ND       0,500       ND       3,84         1,2-Dichlorobenzene       ND       0,500       ND       3,00         1,2-Dichloroethane       ND       0,500       ND       2,02         1,2-Dichloropropane       ND       0,500       ND       2,31         1,3,5-Trimethylbenzene       ND       0,500       ND       2,46         1,3-Dichlorobenzene       ND       0,500       ND       3,00         Benzene       ND       0,500       ND       3,00         Benzene       ND       0,500       ND       1,60         Benzyl chloride       ND       0,500       ND       1,94	1 1 1
1,1,2-Trichloroethane         ND         0.500         ND         2.72           1,1-Dichloroethane         ND         0.500         ND         2.02           1,1-Dichloroethane         ND         0.500         ND         1.98           1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2,4-Trimethylbenzene         ND         0.500         ND         2.46           1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,1-Dichloroethane         ND         0.500         ND         2.02           1,1-Dichloroethane         ND         0.500         ND         1.98           1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2,4-Trimethylbenzene         ND         0.500         ND         2.46           1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,1-Dichloroethene         ND         0.500         ND         1.98           1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2,4-Trimethylbenzene         ND         0.500         ND         2.46           1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	
1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2,4-Trimethylbenzene         ND         0.500         ND         2.46           1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,2,4-Trimethylbenzene       ND       0.500       ND       2.46         1,2-Dibromoethane       ND       0.500       ND       3.84         1,2-Dichlorobenzene       ND       0.500       ND       3.00         1,2-Dichloroethane       ND       0.500       ND       2.02         1,2-Dichloropropane       ND       0.500       ND       2.31         1,3,5-Trimethylbenzene       ND       0.500       ND       3.00         1,4-Dichlorobenzene       ND       0.500       ND       3.00         Benzene       ND       0.500       ND       1.60         Benzyl chloride       ND       0.500       ND       2.59         Bromomethane       ND       0.500       ND       1.94	
1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         2.46           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         2.46           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         2.46           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,3,5-Trimethylbenzene         ND         0.500         ND         2.46           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
Bromomethane ND 0.500 ND 1.94	1
110 0.000 110 1101	1
Carbon tetrachloride ND 0.500 ND 3.14	1
	1
Chlorobenzene ND 0.500 ND 2.30	1
Chloroethane ND 0.500 ND 1.32	1
Chloroform         ND         0.500         ND         2.44	1
Chloromethane ND 0.500 ND 1.03	1
cis-1,2-Dichloroethene ND 0.500 ND 1.98	1
cis-1,3-Dichloropropene ND 0.500 ND 2.27	1
Dichlorodifluoromethane ND 1.00 ND 4.94	



Project Name: Lab Number: OLIN L0607483

Project Number: 681076 Report Date: 06/06/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: L0607483-02 05/26/06 10:31 Client ID: **EFFLUENT** Date Received: 05/30/06 Not Specified

Sample Location: WILMINGTON, MA Field Prep:

ppbV		ug/m3			Dilution
Results	RDL	Results	RDL	Qualifier	Factor
ND	0.500	ND	2.17		1
ND	0.500	ND	3.83		1
ND	0.500	ND	3.49		1
ND	0.500	ND	5.33		1
14.5	1.00	50.5	3.47		1
ND	1.00	ND	4.34		1
ND	0.500	ND	2.17		1
ND	0.500	ND	2.13		1
ND	0.500	ND	3.39		1
ND	0.500	ND	1.88		1
ND	0.500	ND	1.98		1
ND	0.500	ND	2.27		1
ND	0.500	ND	2.68		1
1.55	0.500	8.70	2.81		1
ND	0.500	ND	2.18		1
ND	0.500	ND	1.28		1
48.3	0.500	221	2.29		1
ND	0.500	ND	2.29		1
	ND	ND	Results         RDL         Results           ND         0.500         ND           ND         0.500         ND           ND         0.500         ND           ND         0.500         ND           14.5         1.00         50.5           ND         1.00         ND           ND         0.500         ND	Results         RDL         Results         RDL           ND         0.500         ND         2.17           ND         0.500         ND         3.83           ND         0.500         ND         3.49           ND         0.500         ND         5.33           14.5         1.00         50.5         3.47           ND         1.00         ND         4.34           ND         0.500         ND         2.17           ND         0.500         ND         2.13           ND         0.500         ND         3.39           ND         0.500         ND         1.88           ND         0.500         ND         1.98           ND         0.500         ND         2.27           ND         0.500         ND         2.68           1.55         0.500         ND         2.18           ND         0.500         ND         2.18           ND         0.500         ND         2.18           ND         0.500         ND         1.28           48.3         0.500         ND         1.28	Results         RDL         Results         RDL         Qualifier           ND         0.500         ND         2.17           ND         0.500         ND         3.83           ND         0.500         ND         3.49           ND         0.500         ND         5.33           14.5         1.00         50.5         3.47           ND         1.00         ND         4.34           ND         0.500         ND         2.17           ND         0.500         ND         2.13           ND         0.500         ND         3.39           ND         0.500         ND         1.88           ND         0.500         ND         1.98           ND         0.500         ND         2.27           ND         0.500         ND         2.68           1.55         0.500         ND         2.18           ND         0.500         ND         2.18           ND         0.500         ND         1.28           48.3         0.500         ND         1.28



**Project Name:** OLIN Lab Number: L0607483

Project Number: 681076 Report Date: 06/06/06

# Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 05/31/06 18:25

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for sa	ample(s):	01-02 Batch:	WG241298-3			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0607483

Project Number: 681076 Report Date: 06/06/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 05/31/06 18:25

ppbV		ug/m3			Dilution
Results	RDL	Results	RDL	Qualifier	Factor
sample(s):	01-02 Batch:	WG241298-3			
ND	0.500	ND	2.17		1
ND	0.500	ND	3.83		1
ND	0.500	ND	3.49		1
ND	0.500	ND	5.33		1
ND	1.00	ND	3.47		1
ND	1.00	ND	4.34		1
ND	0.500	ND	2.17		1
ND	0.500	ND	2.13		1
ND	0.500	ND	3.39		1
ND	0.500	ND	1.88		1
ND	0.500	ND	1.98		1
ND	0.500	ND	2.27		1
ND	0.500	ND	2.68		1
ND	0.500	ND	2.81		1
ND	0.500	ND	2.18		1
ND	0.500	ND	1.28		1
ND	0.500	ND	2.29		1
ND	0.500	ND	2.29		1
	Results sample(s):  ND  ND  ND  ND  ND  ND  ND  ND  ND  N	Results         RDL           sample(s):         01-02         Batch:           ND         0.500           ND         0.500           ND         0.500           ND         1.00           ND         1.00           ND         0.500           ND         0.500	Results         RDL         Results           sample(s):         01-02 Batch:         WG241298-3           ND         0.500         ND           ND         0.500         ND           ND         0.500         ND           ND         1.00         ND           ND         1.00         ND           ND         0.500         ND	Results         RDL         Results         RDL           sample(s):         01-02 Batch:         WG241298-3           ND         0.500         ND         3.83           ND         0.500         ND         3.49           ND         0.500         ND         5.33           ND         1.00         ND         3.47           ND         1.00         ND         4.34           ND         0.500         ND         2.17           ND         0.500         ND         2.13           ND         0.500         ND         1.88           ND         0.500         ND         1.98           ND         0.500         ND         2.27           ND         0.500         ND         2.81           ND         0.500         ND         2.18           ND         0.500         ND         2.18           ND         0.500         ND         2.18           ND         0.500         ND         2.29	Results         RDL         Results         RDL         Qualifier           sample(s):         01-02 Batch:         WG241298-3         VG241298-3         VG24129



# Lab Control Sample Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

Lab Number:

L0607483

Report Date:

06/06/06

**ALPHA** 

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
/olatile Organic Compounds in Air Asso	ociated sample(s): 01-02	Batch: WG241298-1			
1,1,1-Trichloroethane	79	-	70-130	-	
1,1,2,2-Tetrachloroethane	107	-	70-130	-	
1,1,2-Trichloroethane	108	-	70-130	-	
1,1-Dichloroethane	116	-	70-130	-	
1,1-Dichloroethene	119	-	70-130	-	
1,2,4-Trichlorobenzene	64	-	70-130	-	
1,2,4-Trimethylbenzene	121	-	70-130	-	
1,2-Dibromoethane	107	-	70-130	-	
1,2-Dichlorobenzene	106	-	70-130	-	
1,2-Dichloroethane	113	-	70-130	-	
1,2-Dichloropropane	144	-	70-130	-	
1,3,5-Trimethylbenzene	111	-	70-130	-	
1,3-Dichlorobenzene	114	-	70-130	-	
1,4-Dichlorobenzene	110	-	70-130	-	
Benzene	120	-	70-130	-	
Benzyl chloride	106	-	70-130	-	
Bromomethane	100	-	70-130	-	
Carbon tetrachloride	102	-	70-130	-	
Chlorobenzene	109	-	70-130	-	
Chloroethane	124	-	70-130	-	
Chloroform	127	-	70-130	-	
Chloromethane	102	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number: L0607483

**Report Date:** 06/06/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	ed sample(s): 01-02	Batch: WG241298-1			
cis-1,2-Dichloroethene	126	-	70-130	-	
cis-1,3-Dichloropropene	106	-	70-130	-	
Dichlorodifluoromethane	107	-	70-130	-	
Ethylbenzene	109	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	97	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	113	-	70-130	-	
Hexachlorobutadiene	75	-	70-130	-	
Methylene chloride	129	-	70-130	-	
p/m-Xylene	98	-	70-130	-	
o-Xylene	114	-	70-130	-	
Styrene	99	-	70-130	-	
Tetrachloroethene	115	-	70-130	-	
Toluene	107	-	70-130	-	
trans-1,2-Dichloroethene	128	-	70-130	-	
trans-1,3-Dichloropropene	85	-	70-130	-	
Trichloroethene	109	-	70-130	-	
Trichlorofluoromethane	110	-	70-130	-	
Vinyl bromide	120	-	70-130	-	
Vinyl chloride	114	-	70-130	-	



**Project Name:** OLIN **Project Number:** 681076

Lab Number:

L0607483

Report Date:

arameter	N	lative Sample	Duplicate Sa	ample Units	RPD	RPD Limits
platile Organic Compounds in Air	Associated sample(s): 0	01-02 QC Batch	ID: WG241298-2	QC Sample: L0607483	-01 Client ID:	PRE CARBON
1,1,1-Trichloroethane		ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane		ND	ND	ppbV	NC	25
1,1,2-Trichloroethane		ND	ND	ppbV	NC	25
1,1-Dichloroethane		ND	ND	ppbV	NC	25
1,1-Dichloroethene		ND	ND	ppbV	NC	25
1,2,4-Trichlorobenzene		ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene		ND	ND	ppbV	NC	25
1,2-Dibromoethane		ND	ND	ppbV	NC	25
1,2-Dichlorobenzene		ND	ND	ppbV	NC	25
1,2-Dichloroethane		ND	ND	ppbV	NC	25
1,2-Dichloropropane		ND	ND	ppbV	NC	25
1,3,5-Trimethylbenzene		ND	ND	ppbV	NC	25
1,3-Dichlorobenzene		ND	ND	ppbV	NC	25
1,4-Dichlorobenzene		ND	ND	ppbV	NC	25
Benzene		ND	ND	ppbV	NC	25
Benzyl chloride		ND	ND	ppbV	NC	25
Bromomethane		ND	ND	ppbV	NC	25

**Project Name:** OLIN **Project Number:** 681076

Lab Number: L0607483

Report Date:

rameter	N	Native Sample	Duplicate Sa	ample Units	RPD	RPD Limits
latile Organic Compounds in Air	Associated sample(s): (	01-02 QC Ba	tch ID: WG241298-2	QC Sample: L0607483	-01 Client ID:	PRE CARBON
Carbon tetrachloride		ND	ND	ppbV	NC	25
Chlorobenzene		ND	ND	ppbV	NC	25
Chloroethane		ND	ND	ppbV	NC	25
Chloroform		8.05	8.87	ppbV	10	25
Chloromethane		ND	ND	ppbV	NC	25
cis-1,2-Dichloroethene		ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene		ND	ND	ppbV	NC	25
Dichlorodifluoromethane		ND	ND	ppbV	NC	25
Ethylbenzene		ND	ND	ppbV	NC	25
1,1,2-Trichloro-1,2,2-Trifluoroethane		ND	ND	ppbV	NC	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane		ND	ND	ppbV	NC	25
Hexachlorobutadiene		ND	ND	ppbV	NC	25
Methylene chloride		ND	ND	ppbV	NC	25
p/m-Xylene		ND	ND	ppbV	NC	25
o-Xylene		ND	ND	ppbV	NC	25
Styrene		ND	ND	ppbV	NC	25
Tetrachloroethene		14.9	15.9	ppbV	6	25

**Project Name:** OLIN **Project Number:** 681076

Lab Number:

L0607483

Report Date:

		Duplicate Sa	mple Units	RPD	RPD Limits
latile Organic Compounds in Air Associated sample	e(s): 01-02 QC Batch ID:	WG241298-2	QC Sample: L0607483	-01 Client ID:	PRE CARBON
Toluene	ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichloroethene	ND	ND	ppbV	NC	25
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl bromide	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-2-Pentene	15.7	15.7	ppbV	0	25
2,4,4-Trimethyl-1-Pentene	299.	305	ppbV	2	25

Project Name: OLIN Lab Number: L0607483

Project Number: 681076 Report Date: 06/06/06

**SAMPLE RESULTS** 

Lab ID: L0607483-02 Date Collected: 05/26/06 10:31

Client ID: EFFLUENT Date Received: 05/30/06

Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 43,DRAFT 1 Analytical Date: 06/06/06 13:27

Analyst: PS

### Quality Control Information

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone:

Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Were all QA/QC procedures REQUIRED by the method followed?

Were all performance/acceptance standards for the required procedures achieved?

Yes
Were significant modifications made to the method as specified in Sect 11.3?

No

Parameter	Result	Qualifier	Units	RDL	Dilution Facto
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	976		ug/m3	24.0	1
C9-C12 Aliphatics	3670		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	976		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	3670		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0607483

 Project Number:
 681076
 Report Date:
 06/06/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 06/05/06 19:14

Analyst: PS

Parameter	Result	Qu	alifier	Units	RDL
Petroleum Hydrocarbons in Air for s	ample(s):	02	Batch:	WG241322-7	•
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0

Project Name: OLIN
Project Number: 681076

Lab Number:

L0607483

Report Date:

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associ	ated sample(s): 02 Batc	h: WG241322-6			
1,3-Butadiene	129	-	70-130	-	
Methyl tert butyl ether	73	-	70-130	-	
Benzene	94	-	70-130	-	
Toluene	78	-	70-130	-	
Ethylbenzene	76	-	70-130	-	
p/m-Xylene	76	-	70-130	-	
o-Xylene	78	-	70-130	-	
Naphthalene	112	-	70-130	-	
2-Methylnaphthalene	110	-	70-130	-	
C5-C8 Aliphatics, Adjusted	120	-	70-130	-	
C9-C12 Aliphatics, Adjusted	112	-	70-130	-	
C9-C10 Aromatics	91	-	70-130	-	

**Project Name:** OLIN **Project Number:** 681076

Lab Number:

L0607483 06/06/06

Report Date:

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s):	02 QC Batch ID: WG	241322-2 QC Sample: I	L0607388-03 (	Client ID: DUP S	ample
C5-C8 Aliphatics	424.	413	ug/m3	3	30
C9-C12 Aliphatics	229.	202	ug/m3	13	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	72.1	72.0	ug/m3	0	30
Benzene	ND	ND	ug/m3	NC	30
Toluene	27.8	27.2	ug/m3	2	30
Ethylbenzene	21.5	21.2	ug/m3	1	30
p/m-Xylene	116.	112	ug/m3	4	30
o-Xylene	31.8	29.9	ug/m3	6	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	154.	150	ug/m3	3	30
C9-C12 Aliphatics, Adjusted	169.	144	ug/m3	16	30
C9-C10 Aromatics	59.7	58.4	ug/m3	2	30



 Project Name:
 OLIN
 Lab Number:
 L0607483

 Project Number:
 681076
 Report Date:
 06/06/06

#### **GLOSSARY**

#### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### Data Qualifiers

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified



Project Name: OLIN Lab Number: L0607483
Project Number: 681076 Report Date: 06/06/06

#### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

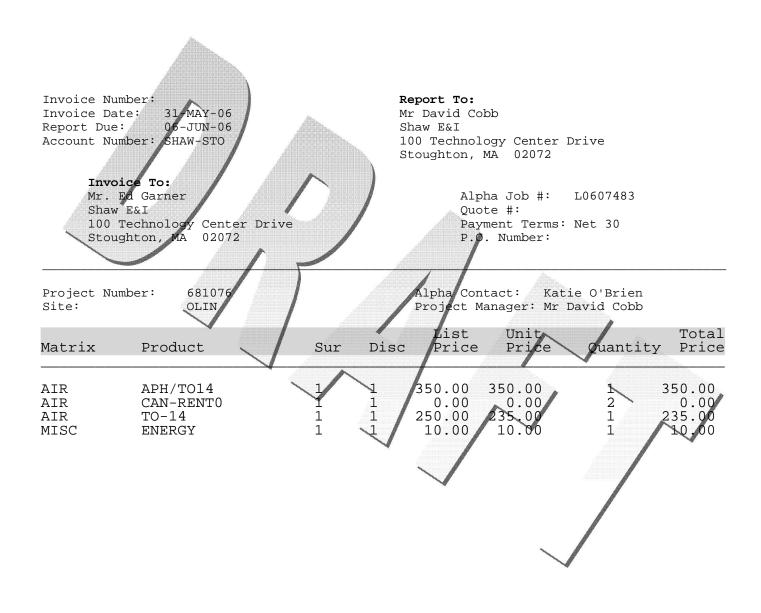
#### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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Form No. 01-03 (rev. 8-JUN-05)				-						-	Z							



Total Amount Due: \$ 595.00

Page 1

Customer Copy

Alpha Analytical, Inc. 8 Walkup Drive Westborough, MA 01581 Ph. 508-898-9220 Fax 508-898-9193 www.alphalab.com



#### ANALYTICAL REPORT

Lab Number: L0610059

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 07/28/06



 Project Name:
 OLIN
 Lab Number:
 L0610059

 Project Number:
 681076
 Report Date:
 07/28/06

Alpha Sample IDClient IDSample LocationL0610059-01PRE CARBONWILMINGTON, MAL0610059-02EFFLUENTWILMINGTON, MA

 Project Name:
 OLIN
 Lab Number:
 L0610059

 Project Number:
 681076
 Report Date:
 07/28/06

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

#### APH:

TO14

L0610059-02 has Acetone, carbon disulfide, butanone, isopropyl alcohol Dimethyl sulfide, methyl isopropyl disulphide, a Siloxane isomer, and acetic acid present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

L0610059-02 has A silane isomer present in the C9-C12 Aliphatic Hydrocarbon range. The response for this analyte was not included in the calculation of the C9-C12 range result since it is not a petroleum hydrocarbon.

L0610059-01 has elevated limits of detection due to the 10x dilutions required by the elevated concentrations of target compounds in the sample.

The WG248002-1 LCS has a low recovery for hexachlorobutadiene.

The WG248002-4 LCS has a low recovery for bromomethane.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director

Date: 07/28/06



### **AIR**



 Project Name:
 OLIN
 Lab Number:
 L0610059

 Project Number:
 681076
 Report Date:
 07/28/06

**SAMPLE RESULTS** 

Lab ID: Date Collected: 07/21/06 15:40

Client ID: PRE CARBON Date Received: 07/24/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 07/28/06 15:06

Analyst: PS

	ppbV	<u>'</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	5.00	ND	27.2		10
1,1,2,2-Tetrachloroethane	ND	5.00	ND	34.3		10
1,1,2-Trichloroethane	ND	5.00	ND	27.2		10
1,1-Dichloroethane	ND	5.00	ND	20.2		10
1,1-Dichloroethene	ND	5.00	ND	19.8		10
1,2,4-Trichlorobenzene	ND	5.00	ND	37.1		10
1,2,4-Trimethylbenzene	ND	5.00	ND	24.6		10
1,2-Dibromoethane	ND	5.00	ND	38.4		10
1,2-Dichlorobenzene	ND	5.00	ND	30.0		10
1,2-Dichloroethane	ND	5.00	ND	20.2		10
1,2-Dichloropropane	ND	5.00	ND	23.1		10
1,3,5-Trimethylbenzene	ND	5.00	ND	24.6		10
1,3-Dichlorobenzene	ND	5.00	ND	30.0		10
1,4-Dichlorobenzene	ND	5.00	ND	30.0		10
Benzene	ND	5.00	ND	16.0		10
Benzyl chloride	ND	5.00	ND	25.9		10
Bromomethane	ND	5.00	ND	19.4		10
Carbon tetrachloride	ND	5.00	ND	31.4		10
Chlorobenzene	ND	5.00	ND	23.0		10
Chloroethane	ND	5.00	ND	13.2		10
Chloroform	ND	5.00	ND	24.4		10
Chloromethane	ND	5.00	ND	10.3		10
cis-1,2-Dichloroethene	ND	5.00	ND	19.8		10
cis-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Dichlorodifluoromethane	ND	10.0	ND	49.4		10



 Project Name:
 OLIN
 Lab Number:
 L0610059

 Project Number:
 681076
 Report Date:
 07/28/06

**SAMPLE RESULTS** 

Lab ID: L0610059-01
Client ID: PRE CARBON
Sample Location: WILMINGTON, MA

Date Collected: 07/21/06 15:40
Date Received: 07/24/06
Field Prep: Not Specified

	ppb\	<u>/</u>	ug/m3	3	Dilutio
Parameter	Results	RDL	Results	RDL	Qualifier Facto
Volatile Organic Compounds in Air					
Ethylbenzene	9.35	5.00	40.6	21.7	10
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	5.00	ND	38.3	10
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	5.00	ND	34.9	10
Hexachlorobutadiene	ND	5.00	ND	53.3	10
Methylene chloride	ND	10.0	ND	34.7	10
p/m-Xylene	54.4	10.0	236	43.4	10
o-Xylene	ND	5.00	ND	21.7	10
Styrene	ND	5.00	ND	21.3	10
Tetrachloroethene	ND	5.00	ND	33.9	10
Toluene	ND	5.00	ND	18.8	10
trans-1,2-Dichloroethene	ND	5.00	ND	19.8	10
trans-1,3-Dichloropropene	ND	5.00	ND	22.7	10
Trichloroethene	ND	5.00	ND	26.8	10
Trichlorofluoromethane	ND	5.00	ND	28.1	10
Vinyl bromide	ND	5.00	ND	21.8	10
Vinyl chloride	ND	5.00	ND	12.8	10
2,4,4-Trimethyl-2-Pentene	31.6	5.00	145	22.9	10
2,4,4-Trimethyl-1-Pentene	352	5.00	1620	22.9	10



**Project Name:** Lab Number: OLIN L0610059 **Project Number:** 681076

**Report Date:** 07/28/06

#### **SAMPLE RESULTS**

Lab ID: L0610059-02 Date Collected: 07/21/06 15:50

Client ID: **EFFLUENT** Date Received: 07/24/06 Sample Location: Field Prep: Not Specified WILMINGTON, MA

Matrix:

Anaytical Method: 48,TO-14A Analytical Date: 07/28/06 01:05

Analyst: PS

Parameter         Results         RDL         Results         RDL         Qualifier           Volatile Organic Compounds in Air         1.1,1-Trichloroethane         ND         0.500         ND         2.72           1,1,2-Tetrachloroethane         ND         0.500         ND         3.43           1,1,2-Trichloroethane         ND         0.500         ND         2.72           1,1-Dichloroethane         ND         0.500         ND         2.02           1,1-Dichloroethane         ND         0.500         ND         1.98           1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2-Trimethylbenzene         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         3.00	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1,1,1-Trichloroethane       ND       0,500       ND       2.72         1,1,2,2-Tetrachloroethane       ND       0,500       ND       3,43         1,1,2-Trichloroethane       ND       0,500       ND       2,72         1,1-Dichloroethane       ND       0,500       ND       2,02         1,1-Dichloroethene       ND       0,500       ND       1,98         1,2,4-Trichlorobenzene       ND       0,500       ND       3,71         1,2,4-Trimethylbenzene       ND       0,500       ND       2,46         1,2-Dichromoethane       ND       0,500       ND       3,84         1,2-Dichlorobenzene       ND       0,500       ND       3,00         1,2-Dichloroethane       ND       0,500       ND       2,02         1,2-Dichloropropane       ND       0,500       ND       2,31         1,3-5-Trimethylbenzene       ND       0,500       ND       3,00         1,4-Dichlorobenzene       ND       0,500       ND       3,00         Benzene       ND       0,500       ND       3,00         Benzene       ND       0,500       ND       2,59         Bromomethane       ND       0,500	1 1 1
1,1,2,2-Tetrachloroethane       ND       0,500       ND       3,43         1,1,2-Trichloroethane       ND       0,500       ND       2,72         1,1-Dichloroethane       ND       0,500       ND       2,02         1,1-Dichloroethene       ND       0,500       ND       1,98         1,2,4-Trichlorobenzene       ND       0,500       ND       3,71         1,2,4-Trimethylbenzene       ND       0,500       ND       2,46         1,2-Dibromoethane       ND       0,500       ND       3,84         1,2-Dichlorobenzene       ND       0,500       ND       3,00         1,2-Dichloroethane       ND       0,500       ND       2,02         1,2-Dichloropropane       ND       0,500       ND       2,31         1,3,5-Trimethylbenzene       ND       0,500       ND       2,46         1,3-Dichlorobenzene       ND       0,500       ND       3,00         Benzene       ND       0,500       ND       3,00         Benzene       ND       0,500       ND       1,60         Benzyl chloride       ND       0,500       ND       1,94	1 1 1
1,1,2-Trichloroethane         ND         0.500         ND         2.72           1,1-Dichloroethane         ND         0.500         ND         2.02           1,1-Dichloroethane         ND         0.500         ND         1.98           1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2,4-Trimethylbenzene         ND         0.500         ND         2.46           1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,1-Dichloroethane         ND         0.500         ND         2.02           1,1-Dichloroethane         ND         0.500         ND         1.98           1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2,4-Trimethylbenzene         ND         0.500         ND         2.46           1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,1-Dichloroethene         ND         0.500         ND         1.98           1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2,4-Trimethylbenzene         ND         0.500         ND         2.46           1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	
1,2,4-Trichlorobenzene         ND         0.500         ND         3.71           1,2,4-Trimethylbenzene         ND         0.500         ND         2.46           1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,2,4-Trimethylbenzene       ND       0.500       ND       2.46         1,2-Dibromoethane       ND       0.500       ND       3.84         1,2-Dichlorobenzene       ND       0.500       ND       3.00         1,2-Dichloroethane       ND       0.500       ND       2.02         1,2-Dichloropropane       ND       0.500       ND       2.31         1,3,5-Trimethylbenzene       ND       0.500       ND       3.00         1,4-Dichlorobenzene       ND       0.500       ND       3.00         Benzene       ND       0.500       ND       1.60         Benzyl chloride       ND       0.500       ND       2.59         Bromomethane       ND       0.500       ND       1.94	
1,2-Dibromoethane         ND         0.500         ND         3.84           1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         3.00           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,2-Dichlorobenzene         ND         0.500         ND         3.00           1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         2.46           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,2-Dichloroethane         ND         0.500         ND         2.02           1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         2.46           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,2-Dichloropropane         ND         0.500         ND         2.31           1,3,5-Trimethylbenzene         ND         0.500         ND         2.46           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,3,5-Trimethylbenzene         ND         0.500         ND         2.46           1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,3-Dichlorobenzene         ND         0.500         ND         3.00           1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
1,4-Dichlorobenzene         ND         0.500         ND         3.00           Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
Benzene         ND         0.500         ND         1.60           Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
Benzyl chloride         ND         0.500         ND         2.59           Bromomethane         ND         0.500         ND         1.94	1
Bromomethane ND 0.500 ND 1.94	1
110 0.000 110 1101	1
Carbon tetrachloride ND 0.500 ND 3.14	1
	1
Chlorobenzene ND 0.500 ND 2.30	1
Chloroethane ND 0.500 ND 1.32	1
Chloroform         ND         0.500         ND         2.44	1
Chloromethane ND 0.500 ND 1.03	1
cis-1,2-Dichloroethene ND 0.500 ND 1.98	1
cis-1,3-Dichloropropene ND 0.500 ND 2.27	1
Dichlorodifluoromethane ND 1.00 ND 4.94	



 Project Name:
 OLIN
 Lab Number:
 L0610059

 Project Number:
 681076
 Report Date:
 07/28/06

**SAMPLE RESULTS** 

Lab ID: L0610059-02
Client ID: EFFLUENT

Sample Location: WILMINGTON, MA

Date Collected: 07/21/06 15:50

Date Received: 07/24/06
Field Prep: Not Specified

Results					Dilution
เงธอนแอ	RDL	Results	RDL	Qualifier	Factor
ND	0.500	ND	2.17		1
ND	0.500	ND	3.83		1
ND	0.500	ND	3.49		1
ND	0.500	ND	5.33		1
3.33	1.00	11.6	3.47		1
ND	1.00	ND	4.34		1
ND	0.500	ND	2.17		1
ND	0.500	ND	2.13		1
ND	0.500	ND	3.39		1
0.429	0.400	1.62	1.51		1
ND	0.500	ND	1.98		1
ND	0.500	ND	2.27		1
ND	0.500	ND	2.68		1
0.595	0.500	3.34	2.81		1
ND	0.500	ND	2.18		1
ND	0.500	ND	1.28		1
14.2	0.500	65.4	2.29		1
43.0	0.500	197	2.29		1
	ND ND ND 3.33 ND	ND 0.500  ND 0.500  ND 0.500  ND 0.500  ND 0.500  3.33 1.00  ND 1.00  ND 0.500   ND         0.500         ND           ND         1.00         ND           ND         0.500         ND           14.2         0.500         65.4	ND       0.500       ND       2.17         ND       0.500       ND       3.83         ND       0.500       ND       3.49         ND       0.500       ND       5.33         3.33       1.00       11.6       3.47         ND       1.00       ND       4.34         ND       0.500       ND       2.17         ND       0.500       ND       2.13         ND       0.500       ND       3.39         0.429       0.400       1.62       1.51         ND       0.500       ND       1.98         ND       0.500       ND       2.27         ND       0.500       ND       2.68         0.595       0.500       3.34       2.81         ND       0.500       ND       2.18         ND       0.500       ND       1.28         14.2       0.500       65.4       2.29	ND 0.500 ND 2.17  ND 0.500 ND 3.83  ND 0.500 ND 3.49  ND 0.500 ND 5.33  3.33 1.00 11.6 3.47  ND 1.00 ND 4.34  ND 0.500 ND 2.17  ND 0.500 ND 2.17  ND 0.500 ND 3.39  0.429 0.400 1.62 1.51  ND 0.500 ND 1.98  ND 0.500 ND 2.27  ND 0.500 ND 2.27  ND 0.500 ND 2.68  0.595 0.500 ND 2.18  ND 0.500 ND 2.18  ND 0.500 ND 1.28  ND 0.500 ND 1.28  ND 0.500 ND 1.28	



**Project Name:** OLIN Lab Number: L0610059

Project Number: 681076 Report Date: 07/28/06

## Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 07/27/06 10:11

	ppbV ug/m3				Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	r sample(s): 0	2 Batch: V	VG248002-3			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0610059

Project Number: 681076 Report Date: 07/28/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 07/27/06 10:11

	ppb	ppbV ug/m3		3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	02 Batch:	WG248002-3			
Ethylbenzene	ND	0.500	ND	2.17		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.500	ND	3.83		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl bromide	ND	0.500	ND	2.18		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



Project Name: OLIN Lab Number: L0610059

Project Number: 681076 Report Date: 07/28/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 07/28/06 14:26

	ppbV		ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for sa	ample(s): 01	Batch:	WG248002-5			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0610059

Project Number: 681076 Report Date: 07/28/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 07/28/06 14:26

	ppbV	ug/m3			Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s): 01	Batch:	WG248002-5			
Ethylbenzene	ND	0.500	ND	2.17		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.500	ND	3.83		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl bromide	ND	0.500	ND	2.18		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



Project Name: OLIN
Project Number: 681076

Lab Number: L0610059

**Report Date:** 07/28/06

rameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associ	ciated sample(s): 02 Ba	tch: WG248002-1			
1,1,1-Trichloroethane	93	-	70-130	-	
1,1,2,2-Tetrachloroethane	113	-	70-130	-	
1,1,2-Trichloroethane	90	-	70-130	-	
1,1-Dichloroethane	93	-	70-130	-	
1,1-Dichloroethene	86	-	70-130	-	
1,2,4-Trichlorobenzene	74	-	70-130	-	
1,2,4-Trimethylbenzene	115	-	70-130	-	
1,2-Dibromoethane	91	-	70-130	-	
1,2-Dichlorobenzene	111	-	70-130	-	
1,2-Dichloroethane	103	-	70-130	-	
1,2-Dichloropropane	112	-	70-130	-	
1,3,5-Trimethylbenzene	112	-	70-130	-	
1,3-Dichlorobenzene	110	-	70-130	-	
1,4-Dichlorobenzene	109	-	70-130	-	
Benzene	102	-	70-130	-	
Benzyl chloride	113	-	70-130	-	
Bromomethane	70	-	70-130	-	
Carbon tetrachloride	85	-	70-130	-	
Chlorobenzene	98	-	70-130	-	
Chloroethane	88	-	70-130	-	
Chloroform	95	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0610059

**Report Date:** 07/28/06

Coloromethane	arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
cis-1,2-Dichloroethene         93         -         70-130         -           cis-1,3-Dichloropropene         97         -         70-130         -           Dichlorodifluoromethane         75         -         70-130         -           Ethylbenzene         108         -         70-130         -           1,1,2-Trichloro-1,2,2-Triffluoroethane         87         -         70-130         -           1,2-Dichloro-1,1,2,2-tetrafluoroethane         77         -         70-130         -           Hexachlorobutadiene         67         -         70-130         -           Methylene chloride         107         -         70-130         -           p/m-Xylene         112         -         70-130         -           o-Xylene         103         -         70-130         -           Styrene         104         -         70-130         -           Tetrachloroethene         82         -         70-130         -           Toluene         95         -         70-130         -           trans-1,2-Dichloroethene         100         -         70-130         -           trichloroethene         95         -         70-130	olatile Organic Compounds in Air Asso	ociated sample(s): 02 Ba	tch: WG248002-1			
cis-1,3-Dichloropropene       97       -       70-130       -         Dichlorodifluoromethane       75       -       70-130       -         Ethylbenzene       108       -       70-130       -         1,1,2-Trichloro-1,2,2-Triffluoroethane       87       -       70-130       -         1,2-Dichloro-1,1,2,2-tetrafluoroethane       77       -       70-130       -         Hexachlorobutadiene       67       -       70-130       -         Methylene chloride       107       -       70-130       -         p/m-Xylene       112       -       70-130       -         o-Xylene       103       -       70-130       -         Styrene       104       -       70-130       -         Tetrachloroethene       82       -       70-130       -         Toluene       95       -       70-130       -         trans-1,2-Dichloroethene       100       -       70-130       -         trans-1,3-Dichloropropene       84       -       70-130       -         Trichloroethene       95       -       70-130       -         Trichlorofluoromethane       84       -       70-130	Chloromethane	74	-	70-130	-	
Dichlorodifluoromethane         75         -         70-130         -           Ethylbenzene         108         -         70-130         -           1,1,2-Trichloro-1,2,2-Trifluoroethane         87         -         70-130         -           1,2-Dichloro-1,1,2,2-tetrafluoroethane         77         -         70-130         -           Hexachlorobutadine         67         -         70-130         -           Methylene chloride         107         -         70-130         -           o-Xylene         112         -         70-130         -           o-Xylene         103         -         70-130         -           Styrene         104         -         70-130         -           Tetrachloroethene         82         -         70-130         -           Toluene         95         -         70-130         -           trans-1,2-Dichloroethene         100         -         70-130         -           trans-1,3-Dichloropropene         84         -         70-130         -           Trichloroethene         95         -         70-130         -           Trichloroethene         95         -         70-130 <t< td=""><td>cis-1,2-Dichloroethene</td><td>93</td><td>-</td><td>70-130</td><td>-</td><td></td></t<>	cis-1,2-Dichloroethene	93	-	70-130	-	
Ethylbenzene         108         - 70-130         - 70-130           1.1,2-Trichloro-1,2,2-Trifluoroethane         87         - 70-130         - 70-130           1,2-Dichloro-1,1,2,2-tetrafluoroethane         77         - 70-130         - 70-130           Hexachlorobutadiene         67         - 70-130         - 70-130           Methylene chloride         107         - 70-130         - 70-130           o-Xylene         112         - 70-130         - 70-130           Styrene         103         - 70-130         - 70-130           Styrene         104         - 70-130         - 70-130           Totluene         82         - 70-130         - 70-130           trans-1,2-Dichloroethene         95         - 70-130         - 70-130           trans-1,3-Dichloropropene         84         - 70-130         - 70-130           Trichloroethene         95         - 70-130         - 70-130           Trichlorothene         95         - 70-130         - 70-130	cis-1,3-Dichloropropene	97	-	70-130	-	
1,1,2-Trichloro-1,2,2-tetrafluoroethane         87         - 70-130            1,2-Dichloro-1,1,2,2-tetrafluoroethane         77         - 70-130            Hexachlorobutadiene         67         - 70-130            Methylene chloride         107         - 70-130            p/m-Xylene         112         - 70-130            o-Xylene         103         - 70-130            Styrene         104         - 70-130            Tetrachloroethene         82         - 70-130            Toluene         95         - 70-130            trans-1,2-Dichloroethene         100         - 70-130            trans-1,3-Dichloropropene         84         - 70-130            Trichloroethene         95         - 70-130            Trichloropropene         84         - 70-130            Trichloroethene         95         - 70-130            Trichloropropene         84         - 70-130            Trichloropropene         84         - 70-130            Trichloropropene         84         - 70-130 </td <td>Dichlorodifluoromethane</td> <td>75</td> <td>-</td> <td>70-130</td> <td>-</td> <td></td>	Dichlorodifluoromethane	75	-	70-130	-	
1,2-Dichloro-1,1,2-tetrafluoroethane         77         -         70-130         -           Hexachlorobutadiene         67         -         70-130         -           Methylene chloride         107         -         70-130         -           p/m-Xylene         112         -         70-130         -           o-Xylene         103         -         70-130         -           Styrene         104         -         70-130         -           Tetrachloroethene         82         -         70-130         -           Toluene         95         -         70-130         -           trans-1,2-Dichloroethene         100         -         70-130         -           trans-1,3-Dichloropropene         84         -         70-130         -           Trichloroethene         95         -         70-130         -           Trichloroethene         84         -         70-130         -	Ethylbenzene	108	-	70-130	-	
Hexachlorobutadiene         67         - 0-130	1,1,2-Trichloro-1,2,2-Trifluoroethane	87	-	70-130	-	
Methylene chloride         107         -         70-130         -           p/m-Xylene         112         -         70-130         -           o-Xylene         103         -         70-130         -           Styrene         104         -         70-130         -           Tetrachloroethene         82         -         70-130         -           Toluene         95         -         70-130         -           trans-1,2-Dichloroethene         100         -         70-130         -           trans-1,3-Dichloropropene         84         -         70-130         -           Trichloroethene         95         -         70-130         -           Trichlorofluoromethane         84         -         70-130         -           Vinyl bromide         104         -         70-130         -	1,2-Dichloro-1,1,2,2-tetrafluoroethane	77	-	70-130	-	
p/m-Xylene         112         -         70-130         -           c-Xylene         103         -         70-130         -           Styrene         104         -         70-130         -           Tetrachloroethene         82         -         70-130         -           Toluene         95         -         70-130         -           trans-1,2-Dichloroethene         100         -         70-130         -           trans-1,3-Dichloropropene         84         -         70-130         -           Trichloroethene         95         -         70-130         -           Trichlorofluoromethane         84         -         70-130         -           Vinyl bromide         104         -         70-130         -	Hexachlorobutadiene	67	-	70-130	-	
o-Xylene         103         -         70-130         -           Styrene         104         -         70-130         -           Tetrachloroethene         82         -         70-130         -           Toluene         95         -         70-130         -           trans-1,2-Dichloroethene         100         -         70-130         -           trans-1,3-Dichloropropene         84         -         70-130         -           Trichloroethene         95         -         70-130         -           Trichlorofluoromethane         84         -         70-130         -           Vinyl bromide         104         -         70-130         -	Methylene chloride	107	-	70-130	-	
Styrene       104       -       70-130       -         Tetrachloroethene       82       -       70-130       -         Toluene       95       -       70-130       -         trans-1,2-Dichloroethene       100       -       70-130       -         trans-1,3-Dichloropropene       84       -       70-130       -         Trichloroethene       95       -       70-130       -         Trichlorofluoromethane       84       -       70-130       -         Vinyl bromide       104       -       70-130       -	p/m-Xylene	112	-	70-130	-	
Tetrachloroethene       82       -       70-130       -         Toluene       95       -       70-130       -         trans-1,2-Dichloroethene       100       -       70-130       -         trans-1,3-Dichloropropene       84       -       70-130       -         Trichloroethene       95       -       70-130       -         Trichlorofluoromethane       84       -       70-130       -         Vinyl bromide       104       -       70-130       -	o-Xylene	103	-	70-130	-	
Toluene       95       -       70-130       -         trans-1,2-Dichloroethene       100       -       70-130       -         trans-1,3-Dichloropropene       84       -       70-130       -         Trichloroethene       95       -       70-130       -         Trichlorofluoromethane       84       -       70-130       -         Vinyl bromide       104       -       70-130       -	Styrene	104	-	70-130	-	
trans-1,2-Dichloroethene       100       -       70-130       -         trans-1,3-Dichloropropene       84       -       70-130       -         Trichloroethene       95       -       70-130       -         Trichlorofluoromethane       84       -       70-130       -         Vinyl bromide       104       -       70-130       -	Tetrachloroethene	82	-	70-130	-	
trans-1,3-Dichloropropene         84         -         70-130         -           Trichloroethene         95         -         70-130         -           Trichlorofluoromethane         84         -         70-130         -           Vinyl bromide         104         -         70-130         -	Toluene	95	-	70-130	-	
Trichloroethene         95         -         70-130         -           Trichlorofluoromethane         84         -         70-130         -           Vinyl bromide         104         -         70-130         -	trans-1,2-Dichloroethene	100	-	70-130	-	
Trichlorofluoromethane         84         -         70-130         -           Vinyl bromide         104         -         70-130         -	trans-1,3-Dichloropropene	84	-	70-130	-	
Vinyl bromide - 70-130 -	Trichloroethene	95	-	70-130	-	
	Trichlorofluoromethane	84	-	70-130	-	
Vinyl chloride 77 - 70-130 -	Vinyl bromide	104	-	70-130	-	
	Vinyl chloride	77	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number:

L0610059

Report Date:

07/28/06

rameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
latile Organic Compounds in Air Associ	iated sample(s): 01 Ba	tch: WG248002-4			
1,1,1-Trichloroethane	101	-	70-130	-	
1,1,2,2-Tetrachloroethane	106	-	70-130	-	
1,1,2-Trichloroethane	80	-	70-130	-	
1,1-Dichloroethane	85	-	70-130	-	
1,1-Dichloroethene	80	-	70-130	-	
1,2,4-Trichlorobenzene	110	-	70-130	-	
1,2,4-Trimethylbenzene	114	-	70-130	-	
1,2-Dibromoethane	86	-	70-130	-	
1,2-Dichlorobenzene	96	-	70-130	-	
1,2-Dichloroethane	92	-	70-130	-	
1,2-Dichloropropane	100	-	70-130	-	
1,3,5-Trimethylbenzene	96	-	70-130	-	
1,3-Dichlorobenzene	92	-	70-130	-	
1,4-Dichlorobenzene	90	-	70-130	-	
Benzene	92	-	70-130	-	
Benzyl chloride	130	-	70-130	-	
Bromomethane	62	-	70-130	-	
Carbon tetrachloride	90	-	70-130	-	
Chlorobenzene	90	-	70-130	-	
Chloroethane	78	-	70-130	-	
Chloroform	89	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0610059

**Report Date:** 07/28/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	ed sample(s): 01 I	Batch: WG248002-4			
Chloromethane	71	-	70-130	-	
cis-1,2-Dichloroethene	89	-	70-130	-	
cis-1,3-Dichloropropene	88	-	70-130	-	
Dichlorodifluoromethane	72	-	70-130	-	
Ethylbenzene	92	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	81	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	71	-	70-130	-	
Hexachlorobutadiene	123	-	70-130	-	
Methylene chloride	108	-	70-130	-	
p/m-Xylene	97	-	70-130	-	
o-Xylene	87	-	70-130	-	
Styrene	84	-	70-130	-	
Tetrachloroethene	83	-	70-130	-	
Toluene	86	-	70-130	-	
trans-1,2-Dichloroethene	94	-	70-130	-	
trans-1,3-Dichloropropene	74	-	70-130	-	
Trichloroethene	90	-	70-130	-	
Trichlorofluoromethane	78	-	70-130	-	
Vinyl bromide	90	-	70-130	-	
Vinyl chloride	73	-	70-130	-	



**Project Name:** OLIN **Project Number:** 681076

Lab Number:

L0610059

Report Date:

07/28/06

arameter		Native Sam	ple	Duplicate Sa	ample Uni	ts	RPD	RPD Limits
olatile Organic Compounds in Air	Associated sample(s):	01-02 QC	Batch ID: V	VG248002-2	QC Sample: I	_0610059-0	02 Client ID:	EFFLUENT
1,1,1-Trichloroethane		ND		ND	ppb	V	NC	25
1,1,2,2-Tetrachloroethane		ND		ND	ppt	V	NC	25
1,1,2-Trichloroethane		ND		ND	ppt	V	NC	25
1,1-Dichloroethane		ND		ND	ppb	V	NC	25
1,1-Dichloroethene		ND		ND	ppb	V	NC	25
1,2,4-Trichlorobenzene		ND		ND	ppb	V	NC	25
1,2,4-Trimethylbenzene		ND		ND	ppb	V	NC	25
1,2-Dibromoethane		ND		ND	ppb	oV	NC	25
1,2-Dichlorobenzene		ND		ND	ppb	oV	NC	25
1,2-Dichloroethane		ND		ND	ppb	oV	NC	25
1,2-Dichloropropane		ND		ND	ppb	oV	NC	25
1,3,5-Trimethylbenzene		ND		ND	ppb	oV	NC	25
1,3-Dichlorobenzene		ND		ND	ppb	oV	NC	25
1,4-Dichlorobenzene		ND		ND	ppb	V	NC	25
Benzene		ND		ND	ppb	V	NC	25
Benzyl chloride		ND		ND	ppb	V	NC	25
Bromomethane		ND		ND	ppb	V	NC	25
Carbon tetrachloride		ND		ND	ppt	V	NC	25
Chlorobenzene		ND		ND	ppt	V	NC	25



Project Name: OLIN
Project Number: 681076

Quality Control Lab Number:

L0610059

roject Number:	681076	Report Date:	07/28/06
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Native	Sample	Duplicate Sa	mple Units	RPD	RPD Limits
Associated sample(s): 01-02	QC Batch ID:	WG248002-2	QC Sample: L0610059	9-02 Client ID:	EFFLUENT
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
;	3.33	3.47	ppbV	4	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
0	.429	0.506	ppbV	16	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	ND	ND	ppbV	NC	25
	Associated sample(s): 01-02		Associated sample(s): 01-02 QC Batch ID: WG248002-2    ND	Associated sample(s):         01-02         QC Batch ID:         WG248002-2         QC Sample:         L0610050           ND         ND         ND         ppbV           ND         ND         ppbV           ND         ND         ppbV           ND         ND         ppbV           ND         ND         ppbV	Associated sample(s): 01-02 QC Batch ID: WG248002-2 QC Sample: L0610059-02 Client ID:    ND



Lab Number:

L0610059

Report Date:

07/28/06

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Volatile Organic Compounds in Air Assoc	ciated sample(s): 01-02 QC Batch ID:	WG248002-2 QC Sa	ample: L0610059	-02 Client ID:	EFFLUENT
Trichlorofluoromethane	0.595	0.571	ppbV	4	25
Vinyl bromide	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-2-Pentene	14.2	15.6	ppbV	9	25
2,4,4-Trimethyl-1-Pentene	43.0	48.4	ppbV	12	25

**Project Name:** 

Project Number:

OLIN

681076

Project Name: OLIN Lab Number: L0610059

Project Number: 681076 Report Date: 07/28/06

**SAMPLE RESULTS** 

Lab ID: L0610059-02 Date Collected: 07/21/06 15:50

Client ID: EFFLUENT Date Received: 07/24/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Sample Location: WILMINGTON, MA Field Prep:

Matrix: Air

Anaytical Method: 43,DRAFT 1

Analyst: CP

07/27/06 12:34

Analytical Date:

#### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone:

Unknown

Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%
Were all QA/QC procedures REQUIRED by the method followed?
Yes

Were all performance/acceptance standards for the required procedures achieved?

Were significant modifications made to the method as specified in Sect 11.3?

No

Parameter	Result	Qualifier	Units	RDL	Dilution Fact
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	289		ug/m3	24.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	2.41		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	4.21		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	281		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	1240		ug/m3	28.0	1
C9-C10 Aromatics	47.2		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0610059

 Project Number:
 681076
 Report Date:
 07/28/06

Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 07/27/06 10:30

Analyst: CP

Parameter	Result	Qu	alifier	Units	RDL
Petroleum Hydrocarbons in Air for sa	ample(s):	02	Batch:	WG247874-5	5
C5-C8 Aliphatics	ND			ug/m3	24.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0

Project Name: OLIN
Project Number: 681076

Lab Number:

L0610059

Report Date:

07/28/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associa	ted sample(s): 02 Batc	h: WG247874-4			
1,3-Butadiene	123	-	70-130	-	
Methyl tert butyl ether	80	-	70-130	-	
Benzene	104	-	70-130	-	
Toluene	107	-	70-130	-	
Ethylbenzene	110	-	70-130	-	
p/m-Xylene	110	-	70-130	-	
o-Xylene	109	-	70-130	-	
Naphthalene	114	-	70-130	-	
2-Methylnaphthalene	119	-	70-130	-	
C5-C8 Aliphatics, Adjusted	116	-	70-130	-	
C9-C12 Aliphatics, Adjusted	115	-	70-130	-	
C9-C10 Aromatics	117	-	70-130	-	



L0610059

## Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

Control Lab Number:

**Report Date:** 07/28/06

OUP Sample
30
30
30
30
30
30
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30
30
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30

 Project Name:
 OLIN
 Lab Number:
 L0610059

 Project Number:
 681076
 Report Date:
 07/28/06

### **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Container Information** 

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0610059-01A	Canister - 6 Liter	NA	NA	NA	Υ	Absent	TO-14
L0610059-02A	Canister - 6 Liter	NA	NA	NA	Υ	Absent	APH,TO-14

#### **Container Comments**



Project Name:OLINLab Number:L0610059Project Number:681076Report Date:07/28/06

#### **GLOSSARY**

### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified

ALPHA WOODS HOLE LASS Project Name: OLIN Lab Number: L0610059
Project Number: 681076 Report Date: 07/28/06

### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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### ANALYTICAL REPORT

Lab Number: L0611874

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 08/31/06



Project Name:OLINLab Number:L0611874Project Number:681076Report Date:08/31/06

Alpha Sample IDClient IDSample LocationL0611874-01PRECARBONWILMINGTON, MAL0611874-02EFFLUENTWILMINGTON, MA



Project Name:OLINLab Number:L0611874Project Number:681076Report Date:08/31/06

### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

TO14

L0611874-01 has elevated detection limits due to the 10x dilutions required by the elevated concentrations of target compounds in the sample.

**APH** 

L0611874-01 has Acetone, Trichloromonofluoromethane, carbon disulfide, and a siloxane isomer present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director Date: 08/31/06

Douglos Sheeley



### **AIR**



Project Name: OLIN Lab Number: L0611874

Project Number: 681076 Report Date: 08/31/06

### **SAMPLE RESULTS**

 Lab ID:
 L0611874-01
 Date Collected:
 08/18/06 00:00

 Client ID:
 PRECARBON
 Date Received:
 08/18/06

Client ID: PRECARBON Date Received: 08/18/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 08/30/06 23:14

Analyst: PS

	ppbV	<u>'</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	5.00	ND	27.2		10
1,1,2,2-Tetrachloroethane	ND	5.00	ND	34.3		10
1,1,2-Trichloroethane	ND	5.00	ND	27.2		10
1,1-Dichloroethane	ND	5.00	ND	20.2		10
1,1-Dichloroethene	ND	5.00	ND	19.8		10
1,2,4-Trichlorobenzene	ND	5.00	ND	37.1		10
1,2,4-Trimethylbenzene	ND	5.00	ND	24.6		10
1,2-Dibromoethane	ND	5.00	ND	38.4		10
1,2-Dichlorobenzene	ND	5.00	ND	30.0		10
1,2-Dichloroethane	ND	5.00	ND	20.2		10
1,2-Dichloropropane	ND	5.00	ND	23.1		10
1,3,5-Trimethylbenzene	ND	5.00	ND	24.6		10
1,3-Dichlorobenzene	ND	5.00	ND	30.0		10
1,4-Dichlorobenzene	ND	5.00	ND	30.0		10
Benzene	ND	5.00	ND	16.0		10
Benzyl chloride	ND	5.00	ND	25.9		10
Bromomethane	ND	5.00	ND	19.4		10
Carbon tetrachloride	ND	5.00	ND	31.4		10
Chlorobenzene	ND	5.00	ND	23.0		10
Chloroethane	ND	5.00	ND	13.2		10
Chloroform	7.40	5.00	36.1	24.4		10
Chloromethane	ND	5.00	ND	10.3		10
cis-1,2-Dichloroethene	ND	5.00	ND	19.8		10
cis-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Dichlorodifluoromethane	ND	10.0	ND	49.4		10



Project Name: OLIN Lab Number: L0611874

Project Number: 681076 Report Date: 08/31/06

### **SAMPLE RESULTS**

 Lab ID:
 L0611874-01
 Date Collected:
 08/18/06 00:00

 Client ID:
 PRECARBON
 Date Received:
 08/18/06

Sample Location: WILMINGTON, MA Field Prep: Not Specified

ppb\	<u>/</u>	ug/m	3	ı	Dilution
Results	RDL	Results	RDL	Qualifier	Factor
ND	5.00	ND	21.7		10
ND	5.00	ND	38.3		10
ND	5.00	ND	34.9		10
ND	5.00	ND	53.3		10
ND	10.0	ND	34.7		10
ND	10.0	ND	43.4		10
ND	5.00	ND	21.7		10
ND	5.00	ND	21.3		10
ND	5.00	ND	33.9		10
ND	5.00	ND	18.8		10
ND	5.00	ND	19.8		10
ND	5.00	ND	22.7		10
ND	5.00	ND	26.8		10
ND	5.00	ND	28.1		10
ND	5.00	ND	12.8		10
177	5.00	812	22.9		10
910	5.00	4180	22.9		10
	Results  ND	ND 5.00  ND 5.00  ND 5.00  ND 5.00  ND 10.0  ND 10.0  ND 5.00   Results         RDL         Results           ND         5.00         ND           ND         5.00         ND           ND         5.00         ND           ND         5.00         ND           ND         10.0         ND           ND         10.0         ND           ND         5.00         ND           177         5.00         812	Results         RDL         Results         RDL           ND         5.00         ND         21.7           ND         5.00         ND         38.3           ND         5.00         ND         34.9           ND         5.00         ND         53.3           ND         10.0         ND         34.7           ND         10.0         ND         43.4           ND         5.00         ND         21.7           ND         5.00         ND         21.3           ND         5.00         ND         33.9           ND         5.00         ND         19.8           ND         5.00         ND         19.8           ND         5.00         ND         22.7           ND         5.00         ND         26.8           ND         5.00         ND         28.1           ND         5.00         ND         12.8           177         5.00         812         22.9	Results         RDL         Results         RDL         Qualifier           ND         5.00         ND         21.7           ND         5.00         ND         38.3           ND         5.00         ND         34.9           ND         5.00         ND         53.3           ND         10.0         ND         34.7           ND         10.0         ND         43.4           ND         5.00         ND         21.7           ND         5.00         ND         21.3           ND         5.00         ND         33.9           ND         5.00         ND         18.8           ND         5.00         ND         19.8           ND         5.00         ND         22.7           ND         5.00         ND         26.8           ND         5.00         ND         28.1           ND         5.00         ND         12.8           177         5.00         812         22.9	



Project Name: OLIN Lab Number: L0611874

Project Number: 681076 Report Date: 08/31/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: 08/18/06 00:00

Client ID: EFFLUENT Date Received: 08/18/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 08/30/06 21:56

Analyst: PS

	ppbV	<u>'</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0611874

Project Number: 681076 Report Date: 08/31/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: 08/18/06 00:00

Client ID: EFFLUENT Date Received: 08/18/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppb\	<u>'</u>	ug/m		Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.500	ND	3.83		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	5.34	0.500	24.5	2.29		1



Project Name: OLIN Lab Number: L0611874

Project Number: 681076 Report Date: 08/31/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 08/30/06 11:50

	ppb\	<u>/</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for sa	ample(s):	01-02 Batch:	WG251792-3			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0611874

Project Number: 681076 Report Date: 08/31/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 08/30/06 11:50

	ppb	v	ug/m3		Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	01-02 Batch:	WG251792-3			
Ethylbenzene	ND	0.500	ND	2.17		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.500	ND	3.83		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



## Lab Control Sample Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

Lab Number:

L0611874

Report Date:

08/31/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Ass	sociated sample(s): 01-02	Batch: WG251792-1			
1,1,1-Trichloroethane	105	-	70-130	-	
1,1,2,2-Tetrachloroethane	106	-	70-130	-	
1,1,2-Trichloroethane	113	-	70-130	-	
1,1-Dichloroethane	104	-	70-130	-	
1,1-Dichloroethene	91	-	70-130	-	
1,2,4-Trichlorobenzene	102	-	70-130	-	
1,2,4-Trimethylbenzene	129	-	70-130	-	
1,2-Dibromoethane	102	-	70-130	-	
1,2-Dichlorobenzene	123	-	70-130	-	
1,2-Dichloroethane	118	-	70-130	-	
1,2-Dichloropropane	116	-	70-130	-	
1,3,5-Trimethylbenzene	127	-	70-130	-	
1,3-Dichlorobenzene	118	-	70-130	-	
1,4-Dichlorobenzene	116	-	70-130	-	
Benzene	120	-	70-130	-	
Benzyl chloride	105	-	70-130	-	
Bromomethane	74	-	70-130	-	
Carbon tetrachloride	95	-	70-130	-	
Chlorobenzene	103	-	70-130	-	
Chloroethane	79	-	70-130	-	
Chloroform	102	-	70-130	-	



## Lab Control Sample Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

Lab Number: L0611874

**Report Date:** 08/31/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	d sample(s): 01-02	Batch: WG251792-1			
Chloromethane	81	-	70-130	-	
cis-1,2-Dichloroethene	111	-	70-130	-	
cis-1,3-Dichloropropene	122	-	70-130	-	
Dichlorodifluoromethane	70	-	70-130	-	
Ethylbenzene	119	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	91	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	77	-	70-130	-	
Hexachlorobutadiene	127	-	70-130	-	
Methylene chloride	89	-	70-130	-	
p/m-Xylene	120	-	70-130	-	
o-Xylene	105	-	70-130	-	
Styrene	109	-	70-130	-	
Tetrachloroethene	92	-	70-130	-	
Toluene	109	-	70-130	-	
trans-1,2-Dichloroethene	106	-	70-130	-	
trans-1,3-Dichloropropene	123	-	70-130	-	
Trichloroethene	102	-	70-130	-	
Trichlorofluoromethane	79	-	70-130	-	
Vinyl chloride	77	-	70-130	-	



**Project Name:** OLIN Project Number: 681076 Lab Number: L0611874

08/31/06 Report Date:

arameter		Native :	Sample	Duplicate S	ample Ur	nits	RPD	RPD I	Limits
platile Organic Compounds in Air	Associated sample(s):	01-02	QC Batch ID:	WG251792-2	QC Sample:	L0611874-	-02 Client ID:	EFFLUENT	
1,1,1-Trichloroethane		N	ID	ND	pp	Vdo	NC		25
1,1,2,2-Tetrachloroethane		N	ID	ND	pp	bV	NC		25
1,1,2-Trichloroethane		N	ID	ND	pp	bV	NC		25
1,1-Dichloroethane		N	ID	ND	pp	bV	NC		25
1,1-Dichloroethene		N	ID	ND	pp	bV	NC		25
1,2,4-Trichlorobenzene		N	ID	ND	pp	bV	NC		25
1,2,4-Trimethylbenzene		N	ID	ND	pp	bV	NC		25
1,2-Dibromoethane		N	ID	ND	pp	bV	NC		25
1,2-Dichlorobenzene		N	ID	ND	pp	bV	NC		25
1,2-Dichloroethane		N	ID	ND	pp	bV	NC		25
1,2-Dichloropropane		N	ID	ND	pp	bV	NC		25
1,3,5-Trimethylbenzene		N	ID	ND	pp	bV	NC		25
1,3-Dichlorobenzene		N	ID	ND	pp	bV	NC		25
1,4-Dichlorobenzene		N	ID	ND	pp	bV	NC		25
Benzene		N	ID	ND	pp	bV	NC		25
Benzyl chloride		N	ID	ND	pp	bV	NC		25
Bromomethane		N	ID	ND	pp	bV	NC		25
Carbon tetrachloride		N	ID	ND	pp	bV	NC		25
Chlorobenzene		N	ID	ND	pp	bV	NC		25

Project Name: OLIN
Project Number: 681076

Lab Number:

L0611874 08/31/06

Report Date: 08/

arameter	Native Sample	Duplicate Sam	nple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associate	ed sample(s): 01-02 QC Batch ID	: WG251792-2 C	QC Sample: L0611874-	-02 Client ID:	EFFLUENT
Chloroethane	ND	ND	ppbV	NC	25
Chloroform	ND	ND	ppbV	NC	25
Chloromethane	ND	ND	ppbV	NC	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Dichlorodifluoromethane	ND	ND	ppbV	NC	25
Ethylbenzene	ND	ND	ppbV	NC	25
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ppbV	NC	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ppbV	NC	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25
Methylene chloride	ND	ND	ppbV	NC	25
p/m-Xylene	ND	ND	ppbV	NC	25
o-Xylene	ND	ND	ppbV	NC	25
Styrene	ND	ND	ppbV	NC	25
Tetrachloroethene	ND	ND	ppbV	NC	25
Toluene	ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichloroethene	ND	ND	ppbV	NC	25



Lab Number:

L0611874

Report Date:

08/31/06

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
olatile Organic Compounds in Air As	ssociated sample(s): 01-02 QC Batch ID:	WG251792-2 QC S	Sample: L0611874	-02 Client ID:	EFFLUENT
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-2-Pentene	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-1-Pentene	5.34	5.74	ppbV	7	25

**Project Name:** 

**Project Number:** 

OLIN

681076

Project Name: OLIN Lab Number: L0611874

Project Number: 681076 Report Date: 08/31/06

**SAMPLE RESULTS** 

Lab ID: Date Collected: 08/18/06 00:00

Client ID: EFFLUENT Date Received: 08/18/06

Sample Location: WILMINGTON, MA Field Prep: Not Specified Matrix: Air

Anaytical Method: 43,DRAFT 1

Analytical Date: 08/23/06 04:58

Analyst: CP

### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone: Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%

Were all QA/QC procedures REQUIRED by the method followed?

Sampling Flow Meter RPD of pre & post-sampling calibration check:
<=10%</p>
Yes

Were all performance/acceptance standards for the required procedures achieved?

Yes
Were significant modifications made to the method as specified in Sect 11.3?

No

Parameter	Result	Qualifier	Units	RDL	Dilution Facto
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	134		ug/m3	24.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	128		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	668		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0611874

 Project Number:
 681076
 Report Date:
 08/31/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 08/23/06 01:11

Analyst: CP

Parameter	Result	Qu	alifier	Units	RDL
Petroleum Hydrocarbons in Air for s	ample(s):	02	Batch:	WG251022-2	
C5-C8 Aliphatics	ND			ug/m3	24.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



## Lab Control Sample Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

Lab Number: L0611874

**Report Date:** 08/31/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sa	ample(s): 02 Bat	ch: WG251022-1			
1,3-Butadiene	91	-	70-130	-	
Methyl tert butyl ether	93	-	70-130	-	
Benzene	96	-	70-130	-	
Toluene	86	-	70-130	-	
Ethylbenzene	120	-	70-130	-	
p/m-Xylene	87	-	70-130	-	
o-Xylene	112	-	70-130	-	
Naphthalene	110	-	70-130	-	
2-Methylnaphthalene	113	-	70-130	-	
C5-C8 Aliphatics, Adjusted	87	-	70-130	-	
C9-C12 Aliphatics, Adjusted	96	-	70-130	-	
C9-C10 Aromatics	71	-	70-130	-	



**Project Name:** OLIN **Project Number:** 681076 Lab Number: L0611874

08/31/06 Report Date:

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s)	: 02 QC Batch ID: WG2	51022-3 QC Sample: L	_0611510-04 C	Client ID: DUP Sa	mple
C5-C8 Aliphatics	55.7	38.5	ug/m3	37	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	2.93	2.62	ug/m3	11	30
Toluene	7.27	7.32	ug/m3	1	30
Ethylbenzene	ND	ND	ug/m3	NC	30
p/m-Xylene	ND	ND	ug/m3	NC	30
o-Xylene	ND	ND	ug/m3	NC	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	41.3	24.7	ug/m3	50	30
C9-C12 Aliphatics, Adjusted	124	103	ug/m3	19	30
C9-C10 Aromatics	ND	ND	ug/m3	NC	30

 Project Name:
 OLIN
 Lab Number:
 L0611874

 Project Number:
 681076
 Report Date:
 08/31/06

### **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Container Information** 

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0611874-01A	Canister - 2.7 Liter	NA	NA	NA	Υ	Absent	TO-14
L0611874-02A	Canister - 2.7 Liter	NA	NA	NA	Υ	Absent	APH,TO-14

### **Container Comments**



Project Name:OLINLab Number:L0611874Project Number:681076Report Date:08/31/06

#### **GLOSSARY**

### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified



Project Name: OLIN Lab Number: L0611874
Project Number: 681076 Report Date: 08/31/06

### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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### ANALYTICAL REPORT

Lab Number: L0613214

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 09/22/06

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (200305), NJ (MA935), RI (LAO00065), ME (2006012), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.



 Project Name:
 OLIN
 Lab Number:
 L0613214

 Project Number:
 681076
 Report Date:
 09/22/06

Alpha Sample IDClient IDSample LocationL0613214-01PRECARBONWILMINGTON, MAL0613214-02EFFLUENTWILMINGTON, MA

 Project Name:
 OLIN
 Lab Number:
 L0613214

 Project Number:
 681076
 Report Date:
 09/22/06

### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

Volatile Organic Compounds in Air

L0613214-01 has elevated detection limits due to the 10x dilution required by the elevated concentrations of target compounds in the sample.

Petroleum Hydrocarbons in Air

L0613214-02: Acetone, Methylene chloride, and a siloxane isomer are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

The LCS % recovery for Naphthalene is above the acceptance criteria for the method.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director Date: 09/22/06



### **AIR**



Project Name: OLIN Lab Number: L0613214

Project Number: 681076 Report Date: 09/22/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: 09/15/06 14:30

Client ID: PRECARBON Date Received: 09/18/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 09/22/06 03:22

Analyst: PS

	ppb\	<u>'</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	5.00	ND	27.2		10
1,1,2,2-Tetrachloroethane	ND	5.00	ND	34.3		10
1,1,2-Trichloroethane	ND	5.00	ND	27.2		10
1,1-Dichloroethane	ND	5.00	ND	20.2		10
1,1-Dichloroethene	ND	5.00	ND	19.8		10
1,2,4-Trichlorobenzene	ND	5.00	ND	37.1		10
1,2,4-Trimethylbenzene	ND	5.00	ND	24.6		10
1,2-Dibromoethane	ND	5.00	ND	38.4		10
1,2-Dichlorobenzene	ND	5.00	ND	30.0		10
1,2-Dichloroethane	ND	5.00	ND	20.2		10
1,2-Dichloropropane	ND	5.00	ND	23.1		10
1,3,5-Trimethylbenzene	ND	5.00	ND	24.6		10
1,3-Dichlorobenzene	ND	5.00	ND	30.0		10
1,4-Dichlorobenzene	ND	5.00	ND	30.0		10
Benzene	ND	5.00	ND	16.0		10
Benzyl chloride	ND	5.00	ND	25.9		10
Bromomethane	ND	5.00	ND	19.4		10
Carbon tetrachloride	ND	5.00	ND	31.4		10
Chlorobenzene	ND	5.00	ND	23.0		10
Chloroethane	ND	5.00	ND	13.2		10
Chloroform	ND	5.00	ND	24.4		10
Chloromethane	ND	5.00	ND	10.3		10
cis-1,2-Dichloroethene	ND	5.00	ND	19.8		10
cis-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Dichlorodifluoromethane	ND	10.0	ND	49.4		10



Project Name: OLIN Lab Number: L0613214

Project Number: 681076 Report Date: 09/22/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: 09/15/06 14:30

Client ID: PRECARBON Date Received: 09/18/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

ppbV		ug/m			Dilution
Results	RDL	Results	RDL	Qualifier	Factor
ND	5.00	ND	21.7		10
ND	5.00	ND	38.3		10
ND	5.00	ND	34.9		10
ND	5.00	ND	53.3		10
ND	10.0	ND	34.7		10
ND	10.0	ND	43.4		10
ND	5.00	ND	21.7		10
ND	5.00	ND	21.3		10
ND	5.00	ND	33.9		10
ND	5.00	ND	18.8		10
ND	5.00	ND	19.8		10
ND	5.00	ND	22.7		10
ND	5.00	ND	26.8		10
ND	5.00	ND	28.1		10
ND	5.00	ND	21.8		10
ND	5.00	ND	12.8		10
147	5.00	672	22.9		10
607	5.00	2780	22.9		10
	ND N	ND 5.00  ND 5.00  ND 5.00  ND 5.00  ND 10.0  ND 10.0  ND 10.0  ND 5.00   ND 5.00 ND ND 5.00 ND ND 5.00 ND ND 5.00 ND ND 10.0 ND ND 10.0 ND ND 10.0 ND ND 5.00 ND	ND 5.00 ND 21.7  ND 5.00 ND 38.3  ND 5.00 ND 34.9  ND 5.00 ND 53.3  ND 10.0 ND 34.7  ND 10.0 ND 43.4  ND 5.00 ND 21.7  ND 5.00 ND 21.7  ND 5.00 ND 33.9  ND 5.00 ND 33.9  ND 5.00 ND 18.8  ND 5.00 ND 19.8  ND 5.00 ND 22.7  ND 5.00 ND 22.7  ND 5.00 ND 22.7  ND 5.00 ND 22.8  ND 5.00 ND 21.8   ND 5.00 ND 21.7  ND 5.00 ND 38.3  ND 5.00 ND 34.9  ND 5.00 ND 53.3  ND 10.0 ND 34.7  ND 10.0 ND 43.4  ND 5.00 ND 21.7  ND 5.00 ND 21.7  ND 5.00 ND 21.3  ND 5.00 ND 33.9  ND 5.00 ND 18.8  ND 5.00 ND 19.8  ND 5.00 ND 22.7  ND 5.00 ND 22.7  ND 5.00 ND 22.7  ND 5.00 ND 22.7  ND 5.00 ND 22.8  ND 5.00 ND 28.1  ND 5.00 ND 21.8  ND 5.00 ND 21.8  ND 5.00 ND 12.8  ND 5.00 ND 12.8  ND 5.00 ND 12.8  ND 5.00 ND 12.8		



Project Name: OLIN Lab Number: L0613214

Project Number: 681076 Report Date: 09/22/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: 09/15/06 14:35

Client ID: EFFLUENT Date Received: 09/18/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 09/22/06 02:36

Analyst: PS

	ppbV	<u>'</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	0.980	0.500	2.58	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0613214

Project Number: 681076 Report Date: 09/22/06

### **SAMPLE RESULTS**

Lab ID: Date Collected: 09/15/06 14:35

Client ID: EFFLUENT Date Received: 09/18/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

ppbV		ug/m3	3		Dilution
Results	RDL	Results	RDL	Qualifier	Factor
ND	0.500	ND	2.17		1
ND	0.500	ND	3.83		1
ND	0.500	ND	3.49		1
ND	0.500	ND	5.33		1
11.2	1.00	38.8	3.47		1
1.42	1.00	6.17	4.34		1
ND	0.500	ND	2.17		1
ND	0.500	ND	2.13		1
ND	0.500	ND	3.39		1
ND	0.500	ND	1.88		1
ND	0.500	ND	1.98		1
ND	0.500	ND	2.27		1
ND	0.500	ND	2.68		1
ND	0.500	ND	2.81		1
ND	0.500	ND	2.18		1
ND	0.500	ND	1.28		1
ND	0.500	ND	2.29		1
ND	0.500	ND	2.29		1
	Results  ND ND ND 11.2 1.42 ND	Results         RDL           ND         0.500           ND         0.500           ND         0.500           ND         0.500           11.2         1.00           1.42         1.00           ND         0.500           ND         0.500	Results         RDL         Results           ND         0.500         ND           ND         0.500         ND           ND         0.500         ND           ND         0.500         ND           11.2         1.00         38.8           1.42         1.00         6.17           ND         0.500         ND           ND         0.500         ND	Results         RDL         Results         RDL           ND         0.500         ND         2.17           ND         0.500         ND         3.83           ND         0.500         ND         3.49           ND         0.500         ND         5.33           11.2         1.00         38.8         3.47           1.42         1.00         6.17         4.34           ND         0.500         ND         2.17           ND         0.500         ND         2.13           ND         0.500         ND         3.39           ND         0.500         ND         1.88           ND         0.500         ND         1.98           ND         0.500         ND         2.27           ND         0.500         ND         2.81           ND         0.500         ND         2.18           ND         0.500         ND         2.18           ND         0.500         ND         1.28           ND         0.500         ND         2.18           ND         0.500         ND         1.28           ND         0.500	Results         RDL         Results         RDL         Qualifier           ND         0.500         ND         2.17           ND         0.500         ND         3.83           ND         0.500         ND         3.49           ND         0.500         ND         5.33           11.2         1.00         38.8         3.47           1.42         1.00         6.17         4.34           ND         0.500         ND         2.17           ND         0.500         ND         2.13           ND         0.500         ND         3.39           ND         0.500         ND         1.88           ND         0.500         ND         1.98           ND         0.500         ND         2.27           ND         0.500         ND         2.68           ND         0.500         ND         2.81           ND         0.500         ND         2.18           ND         0.500         ND         1.28           ND         0.500         ND         1.28           ND         0.500         ND         1.28           ND



Project Name: OLIN Lab Number: L0613214

Project Number: 681076 Report Date: 09/22/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 09/21/06 07:28

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	sample(s):	01-02 Batch:	WG254266-3			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0613214

Project Number: 681076 Report Date: 09/22/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 09/21/06 07:28

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	sample(s):	01-02 Batch:	WG254266-3			
Ethylbenzene	ND	0.500	ND	2.17		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.500	ND	3.83		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl bromide	ND	0.500	ND	2.18		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



**Project Name:** OLIN **Project Number:** 681076 Lab Number:

L0613214

Report Date: 09/22/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	ed sample(s): 01-02	Batch: WG254266-1			
1,1,1-Trichloroethane	85	-	70-130	-	
1,1,2,2-Tetrachloroethane	86	-	70-130	-	
1,1,2-Trichloroethane	107	-	70-130	-	
1,1-Dichloroethane	82	-	70-130	-	
1,1-Dichloroethene	105	-	70-130	-	
1,2,4-Trichlorobenzene	88	-	70-130	-	
1,2,4-Trimethylbenzene	88	-	70-130	-	
1,2-Dibromoethane	114	-	70-130	-	
1,2-Dichlorobenzene	97	-	70-130	-	
1,2-Dichloroethane	97	-	70-130	-	
1,2-Dichloropropane	125	-	70-130	-	
1,3,5-Trimethylbenzene	101	-	70-130	-	
1,3-Dichlorobenzene	91	-	70-130	-	
1,4-Dichlorobenzene	97	-	70-130	-	
Benzene	119	-	70-130	-	
Benzyl chloride	96	-	70-130	-	
Bromomethane	82	-	70-130	-	
Carbon tetrachloride	81	-	70-130	-	
Chlorobenzene	87	-	70-130	-	
Chloroethane	100	-	70-130	-	
Chloroform	79	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0613214

**Report Date:** 09/22/06

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Associated	d sample(s): 01-02	Batch: WG254266-1			
Chloromethane	80	-	70-130	-	
cis-1,2-Dichloroethene	83	-	70-130	-	
cis-1,3-Dichloropropene	111	-	70-130	-	
Dichlorodifluoromethane	72	-	70-130	-	
Ethylbenzene	117	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	102	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	80	-	70-130	-	
Hexachlorobutadiene	76	-	70-130	-	
Methylene chloride	93	-	70-130	-	
p/m-Xylene	117	-	70-130	-	
o-Xylene	110	-	70-130	-	
Styrene	107	-	70-130	-	
Tetrachloroethene	93	-	70-130	-	
Toluene	119	-	70-130	-	
trans-1,2-Dichloroethene	75	-	70-130	-	
trans-1,3-Dichloropropene	105	-	70-130	-	
Trichloroethene	99	-	70-130	-	
Trichlorofluoromethane	87	-	70-130	-	
Vinyl bromide	103	-	70-130	-	
Vinyl chloride	81	-	70-130	-	



L0613214

# Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

uality Control Lab Number:

**Report Date:** 09/22/06

arameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG254266-2	QC Sample: L0613214-01	Client ID:	PRECARBON
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorobenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	ND	ND	ppbV	NC	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethylbenzene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
Benzene	ND	ND	ppbV	NC	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25



L0613214

# Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

uality Control Lab Number:

**Report Date:** 09/22/06

arameter		Native	Sample	Duplicate Sa	ample Units	RPD	RPD Limits
olatile Organic Compounds in Air	Associated sample(s):	01-02	QC Batch ID:	WG254266-2	QC Sample: L0613214	4-01 Client ID:	PRECARBON
Chloroethane		N	D	ND	ppbV	NC	25
Chloroform		N	D	ND	ppbV	NC	25
Chloromethane		N	D	ND	ppbV	NC	25
cis-1,2-Dichloroethene		N	D	ND	ppbV	NC	25
cis-1,3-Dichloropropene		N	D	ND	ppbV	NC	25
Dichlorodifluoromethane		N	D	ND	ppbV	NC	25
Ethylbenzene		N	D	ND	ppbV	NC	25
1,1,2-Trichloro-1,2,2-Trifluoroethane		N	D	ND	ppbV	NC	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane		N	D	ND	ppbV	NC	25
Hexachlorobutadiene		N	D	ND	ppbV	NC	25
Methylene chloride		N	D	ND	ppbV	NC	25
p/m-Xylene		N	D	ND	ppbV	NC	25
o-Xylene		N	D	ND	ppbV	NC	25
Styrene		N	D	ND	ppbV	NC	25
Tetrachloroethene		N	D	ND	ppbV	NC	25
Toluene		N	D	ND	ppbV	NC	25
trans-1,2-Dichloroethene		N	D	ND	ppbV	NC	25
trans-1,3-Dichloropropene		N	D	ND	ppbV	NC	25
Trichloroethene		N	D	ND	ppbV	NC	25



# Lab Duplicate Analysis Batch Quality Control

Lab Number:

L0613214

Report Date:

09/22/06

Parameter	Native Sample	Duplicate Sample	e Units	RPD	RPD Limits
Volatile Organic Compounds in Air Assoc	iated sample(s): 01-02 QC Batch ID:	WG254266-2 QC	Sample: L0613214-01	Client ID:	: PRECARBON
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl bromide	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-2-Pentene	147	152	ppbV	3	25
2,4,4-Trimethyl-1-Pentene	607	498	ppbV	20	25

**Project Name:** 

Project Number:

OLIN

681076

Project Name: OLIN Lab Number: L0613214

Project Number: 681076 Report Date: 09/22/06

**SAMPLE RESULTS** 

Lab ID: L0613214-02 Date Collected: 09/15/06 14:35

Client ID: EFFLUENT Date Received: 09/18/06

Sample Location: WILMINGTON, MA Field Prep: Not Specified Matrix: Air

Anaytical Method: 43,DRAFT 1
Analytical Date: 09/22/06 12:57

Analyst: CP

**Quality Control Information** 

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone:

Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Were all QA/QC procedures REQUIRED by the method followed?

Yes

Were all performance/acceptance standards for the required procedures achieved?

No

Were significant modifications made to the method as specified in Sect 11.3?

Parameter	Result	Qualifier	Units	RDL	Dilution Fact
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	81.3		ug/m3	24.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	4.29		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	75.5		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	216		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0613214

 Project Number:
 681076
 Report Date:
 09/22/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 09/21/06 21:13

Analyst: CP

Parameter	Result	Qu	alifier	Units	RDL
Petroleum Hydrocarbons in Air for sa	ample(s):	02	Batch:	WG254084-	5
C5-C8 Aliphatics	ND			ug/m3	24.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0

Project Name: OLIN
Project Number: 681076

Lab Number: L0613214

Report Date:

09/22/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associat	ed sample(s): 02 Batc	h: WG254084-4			
1,3-Butadiene	124	-	70-130	-	
Methyl tert butyl ether	130	-	70-130	-	
Benzene	116	-	70-130	-	
Toluene	124	-	70-130	-	
Ethylbenzene	115	-	70-130	-	
p/m-Xylene	128	-	70-130	-	
o-Xylene	117	-	70-130	-	
Naphthalene	149	-	70-130	-	
2-Methylnaphthalene	78	-	70-130	-	
C5-C8 Aliphatics, Adjusted	106	-	70-130	-	
C9-C12 Aliphatics, Adjusted	112	-	70-130	-	
C9-C10 Aromatics	123	-	70-130	-	



### **Lab Duplicate Analysis**

**Project Name:** OLIN **Project Number:** 681076 **Batch Quality Control** Lab Number:

L0613214 09/22/06

**Report Date:** 

**Native Sample Duplicate Sample RPD RPD Limits** Units **Parameter** Petroleum Hydrocarbons in Air Associated sample(s): 02 QC Batch ID: WG254084-3 QC Sample: L0612879-03 Client ID: DUP Sample C5-C8 Aliphatics 117 112 ug/m3 4 30 ND 1,3-Butadiene ND ug/m3 NC 30 ND Methyl tert butyl ether ND ug/m3 NC 30 ND Benzene ND ug/m3 NC 30 NC 30 Toluene ND ND ug/m3 Ethylbenzene ND ND ug/m3 NC 30 NC p/m-Xylene ND ND ug/m3 30 ND o-Xylene ND ug/m3 NC 30 Naphthalene ND ND ug/m3 NC 30 2-Methylnaphthalene ND ND ug/m3 NC 30 C5-C8 Aliphatics, Adjusted 118 113 ug/m3 30 C9-C12 Aliphatics, Adjusted 53.8 49.6 ug/m3 8 30 C9-C10 Aromatics ND ND ug/m3 NC 30



Project Name: OLIN Lab Number: L0613214

Project Number: 681076 Report Date: 09/22/06

#### **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Cooler Information** 

Cooler Custody Seal

**Container Information** 

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0613214-01A	Canister - 2.7 Liter	NA	NA	NA	Υ	Absent	TO-14
L0613214-02A	Canister - 2.7 Liter	NA	NA	NA	Υ	Absent	APH,TO-14

Project Name:OLINLab Number:L0613214Project Number:681076Report Date:09/22/06

#### **GLOSSARY**

#### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified



Project Name: OLIN Lab Number: L0613214
Project Number: 681076 Report Date: 09/22/06

#### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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#### ANALYTICAL REPORT

Lab Number: L0615161

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 11/07/06



Project Name:OLINLab Number:L0615161Project Number:681076Report Date:11/07/06

Alpha Sample IDClient IDSample LocationL0615161-01PRECARBONWILMINGTON, MAL0615161-02EFFLUENTWILMINGTON, MA

Project Name:OLINLab Number:L0615161Project Number:681076Report Date:11/07/06

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

Volatile Organic Compounds in Air

L0615161-01 has elevated detection limits due to the 10x dilution required by the elevated concentrations of target compounds in the sample.

L0615161-01 required re-analysis on a 100x dilution in order to quantitate the sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration.

WG259413-1:

The LCS % recoveries for 1,2,4-Trichlorobenzene and Hexachlorobutadiene are below the acceptance criteria for the method.

WG259413-4:

The LCS % recoveries for 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, and 1,2-Dichlorobenzene are above the acceptance criteria for the method.

Petroleum Hydrocarbons in Air

L0615161-02: Acetone, Methylene chloride, 2-Butanone and a silane isomer are present in the C5-C8 aliphatic range. The response for these analytes was not included in the calculation of the C5-C8 range since they are not petroleum hydrocarbons.

L0615161-02: A c16h32 isomer is present in the C9-C12 aliphatic hydrocarbon range. The response for this analyte was not included in the calculation of the C9-C12 range since it is not a petroleum hydrocarbon.

The LCS % recovery for 2-Methyl-naphthalene is below the acceptance criteria for the method.

WG259557-2 duplicate:

Acetone, Trichloromonofluoromethane, Isopropyl alcohol, Methylene chloride, 2-Butanone,

Tetrachloroethylene and a silane isomer are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.



 Project Name:
 OLIN
 Lab Number:
 L0615161

 Project Number:
 681076
 Report Date:
 11/07/06

#### **Case Narrative (continued)**

Two silane isomers are present in the C9-C12 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C9-C12 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director Date: 11/07/06



### **AIR**



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

#### **SAMPLE RESULTS**

 Lab ID:
 L0615161-01
 Date Collected:
 10/20/06 12:00

 Client ID:
 PRECARBON
 Date Received:
 10/23/06

Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 11/03/06 03:35

Analyst: PS

	ppb\	ppbV		3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	5.00	ND	27.2		10
1,1,2,2-Tetrachloroethane	ND	5.00	ND	34.3		10
1,1,2-Trichloroethane	ND	5.00	ND	27.2		10
1,1-Dichloroethane	ND	5.00	ND	20.2		10
1,1-Dichloroethene	ND	5.00	ND	19.8		10
1,2,4-Trichlorobenzene	ND	5.00	ND	37.1		10
1,2,4-Trimethylbenzene	ND	5.00	ND	24.6		10
1,2-Dibromoethane	ND	5.00	ND	38.4		10
1,2-Dichlorobenzene	ND	5.00	ND	30.0		10
1,2-Dichloroethane	ND	5.00	ND	20.2		10
1,2-Dichloropropane	ND	5.00	ND	23.1		10
1,3,5-Trimethylbenzene	ND	5.00	ND	24.6		10
1,3-Dichlorobenzene	ND	5.00	ND	30.0		10
1,4-Dichlorobenzene	ND	5.00	ND	30.0		10
Benzene	ND	5.00	ND	16.0		10
Benzyl chloride	ND	5.00	ND	25.9		10
Bromomethane	ND	5.00	ND	19.4		10
Carbon tetrachloride	ND	5.00	ND	31.4		10
Chlorobenzene	ND	5.00	ND	23.0		10
Chloroethane	ND	5.00	ND	13.2		10
Chloroform	ND	5.00	ND	24.4		10
Chloromethane	ND	5.00	ND	10.3		10
cis-1,2-Dichloroethene	ND	5.00	ND	19.8		10
cis-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Dichlorodifluoromethane	ND	10.0	ND	49.4		10



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

#### **SAMPLE RESULTS**

 Lab ID:
 L0615161-01
 Date Collected:
 10/20/06 12:00

 Client ID:
 PRECARBON
 Date Received:
 10/23/06

Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppb\	<u> </u>	ug/m3	3		Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor	
Volatile Organic Compounds in Air							
Ethylbenzene	ND	5.00	ND	21.7		10	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	5.00	ND	38.3		10	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	5.00	ND	34.9		10	
Hexachlorobutadiene	ND	5.00	ND	53.3		10	
Methylene chloride	ND	10.0	ND	34.7		10	
p/m-Xylene	ND	10.0	ND	43.4		10	
o-Xylene	ND	5.00	ND	21.7		10	
Styrene	ND	5.00	ND	21.3		10	
Tetrachloroethene	ND	5.00	ND	33.9		10	
Toluene	ND	5.00	ND	18.8		10	
trans-1,2-Dichloroethene	ND	5.00	ND	19.8		10	
trans-1,3-Dichloropropene	ND	5.00	ND	22.7		10	
Trichloroethene	ND	5.00	ND	26.8		10	
Trichlorofluoromethane	ND	5.00	ND	28.1		10	
Vinyl bromide	ND	5.00	ND	21.8		10	
Vinyl chloride	ND	5.00	ND	12.8		10	
2,4,4-Trimethyl-2-Pentene	414	5.00	1900	22.9		10	
2,4,4-Trimethyl-1-Pentene	>1000	5	>4585	22.9		10	



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

**SAMPLE RESULTS** 

Lab ID: Date Collected: 10/20/06 12:00

Client ID: PRECARBON Date Received: 10/23/06
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 11/03/06 14:19

Analyst: PS

	ppbV	<u>'</u>	ug/m3	ug/m3		
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
2,4,4-Trimethyl-1-Pentene	4080	50.6	18700	232		101.23



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

#### **SAMPLE RESULTS**

Lab ID: Date Collected: 10/20/06 12:15

Client ID: EFFLUENT Date Received: 10/23/06
Sample Location: WILMINGTON, MA Field Prep: None

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 11/04/06 14:26

Analyst: PS

	ppbV	<u>'</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	0.840	0.500	2.21	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

#### **SAMPLE RESULTS**

Lab ID: Date Collected: 10/20/06 12:15

Client ID: EFFLUENT Date Received: 10/23/06 Sample Location: WILMINGTON, MA Field Prep: None

	ppb\	<u>/</u>	ug/m	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.500	ND	3.83		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	2.66	1.00	9.23	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl bromide	ND	0.500	ND	2.18		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	0.601	0.500	2.76	2.29		1



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 11/02/06 18:18

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for sa	ample(s): 01	Batch:	WG259413-3			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 11/02/06 18:18

	ppbV		ug/m3	ug/m3		
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s): 01	Batch:	WG259413-3			
Ethylbenzene	ND	0.500	ND	2.17		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.500	ND	3.83		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl bromide	ND	0.500	ND	2.18		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 11/04/06 09:38

	ppb	<u>v</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	02 Batch:	WG259413-5			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorobenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethylbenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 11/04/06 09:38

	ppb\	<u>v</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	02 Batch:	WG259413-5			
Ethylbenzene	ND	0.500	ND	2.17		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.500	ND	3.83		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl bromide	ND	0.500	ND	2.18		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



Project Name: OLIN
Project Number: 681076

Lab Number:

L0615161

Report Date:

11/07/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associ	ated sample(s): 01 Ba	tch: WG259413-1			
1,1,1-Trichloroethane	102	-	70-130	-	
1,1,2,2-Tetrachloroethane	105	-	70-130	-	
1,1,2-Trichloroethane	109	-	70-130	-	
1,1-Dichloroethane	117	-	70-130	-	
1,1-Dichloroethene	96	-	70-130	-	
1,2,4-Trichlorobenzene	63	-	70-130	-	
1,2,4-Trimethylbenzene	117	-	70-130	-	
1,2-Dibromoethane	112	-	70-130	-	
1,2-Dichlorobenzene	122	-	70-130	-	
1,2-Dichloroethane	111	-	70-130	-	
1,2-Dichloropropane	101	-	70-130	-	
1,3,5-Trimethylbenzene	118	-	70-130	-	
1,3-Dichlorobenzene	125	-	70-130	-	
1,4-Dichlorobenzene	124	-	70-130	-	
Benzene	107	-	70-130	-	
Benzyl chloride	79	-	70-130	-	
Bromomethane	96	-	70-130	-	
Carbon tetrachloride	96	-	70-130	-	
Chlorobenzene	123	-	70-130	-	
Chloroethane	102	-	70-130	-	
Chloroform	111	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0615161

**Report Date:** 11/07/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	d sample(s): 01 E	3atch: WG259413-1			
Chloromethane	100	-	70-130	-	
cis-1,2-Dichloroethene	115	-	70-130	-	
cis-1,3-Dichloropropene	108	-	70-130	-	
Dichlorodifluoromethane	94	-	70-130	-	
Ethylbenzene	124	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	108	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	90	-	70-130	-	
Hexachlorobutadiene	65	-	70-130	-	
Methylene chloride	97	-	70-130	-	
p/m-Xylene	125	-	70-130	-	
o-Xylene	129	-	70-130	-	
Styrene	121	-	70-130	-	
Tetrachloroethene	123	-	70-130	-	
Toluene	119	-	70-130	-	
trans-1,2-Dichloroethene	119	-	70-130	-	
trans-1,3-Dichloropropene	103	-	70-130	-	
Trichloroethene	109	-	70-130	-	
Trichlorofluoromethane	90	-	70-130	-	
Vinyl bromide	128	-	70-130	-	
Vinyl chloride	97	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number:

L0615161 11/07/06

Report Date:

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associ	ated sample(s): 02 Ba	tch: WG259413-4			
1,1,1-Trichloroethane	98	-	70-130	-	
1,1,2,2-Tetrachloroethane	120	-	70-130	-	
1,1,2-Trichloroethane	105	-	70-130	-	
1,1-Dichloroethane	111	-	70-130	-	
1,1-Dichloroethene	97	-	70-130	-	
1,2,4-Trichlorobenzene	83	-	70-130	-	
1,2,4-Trimethylbenzene	130	-	70-130	-	
1,2-Dibromoethane	114	-	70-130	-	
1,2-Dichlorobenzene	135	-	70-130	-	
1,2-Dichloroethane	105	-	70-130	-	
1,2-Dichloropropane	103	-	70-130	-	
1,3,5-Trimethylbenzene	130	-	70-130	-	
1,3-Dichlorobenzene	134	-	70-130	-	
1,4-Dichlorobenzene	131	-	70-130	-	
Benzene	105	-	70-130	-	
Benzyl chloride	90	-	70-130	-	
Bromomethane	98	-	70-130	-	
Carbon tetrachloride	95	-	70-130	-	
Chlorobenzene	125	-	70-130	-	
Chloroethane	108	-	70-130	-	
Chloroform	111	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0615161

**Report Date:** 11/07/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associa	ted sample(s): 02 Ba	tch: WG259413-4			
Chloromethane	110	-	70-130	-	
cis-1,2-Dichloroethene	115	-	70-130	-	
cis-1,3-Dichloropropene	106	-	70-130	-	
Dichlorodifluoromethane	95	-	70-130	-	
Ethylbenzene	129	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	105	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	93	-	70-130	-	
Hexachlorobutadiene	77	-	70-130	-	
Methylene chloride	100	-	70-130	-	
p/m-Xylene	127	-	70-130	-	
o-Xylene	128	-	70-130	-	
Styrene	125	-	70-130	-	
Tetrachloroethene	127	-	70-130	-	
Toluene	121	-	70-130	-	
trans-1,2-Dichloroethene	118	-	70-130	-	
trans-1,3-Dichloropropene	97	-	70-130	-	
Trichloroethene	108	-	70-130	-	
Trichlorofluoromethane	88	-	70-130	-	
Vinyl bromide	130	-	70-130	-	
Vinyl chloride	103	-	70-130	-	



# Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

Lab Number:

L0615161

Report Date:

11/07/06

arameter		Native	Sample	Duplicate Sa	ample Units	RPD	RPD Limits
olatile Organic Compounds in Air	Associated sample(s):	01-02	QC Batch ID:	WG259413-2	QC Sample: L061453	38-06 Clien	it ID: DUP Sample
1,1,1-Trichloroethane		N	ID	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane		N	ID	ND	ppbV	NC	25
1,1,2-Trichloroethane		N	ID	ND	ppbV	NC	25
1,1-Dichloroethane		N	ID	ND	ppbV	NC	25
1,1-Dichloroethene		N	ID	ND	ppbV	NC	25
1,2,4-Trichlorobenzene		N	ID	ND	ppbV	NC	25
1,2,4-Trimethylbenzene		N	ID	ND	ppbV	NC	25
1,2-Dibromoethane		N	ID	ND	ppbV	NC	25
1,2-Dichlorobenzene		N	ID	ND	ppbV	NC	25
1,2-Dichloroethane		N	ID	ND	ppbV	NC	25
1,2-Dichloropropane		N	ID	ND	ppbV	NC	25
1,3,5-Trimethylbenzene		N	ID	ND	ppbV	NC	25
1,3-Dichlorobenzene		N	ID	ND	ppbV	NC	25
1,4-Dichlorobenzene		N	ID	ND	ppbV	NC	25
Benzene		N	ID	ND	ppbV	NC	25
Benzyl chloride		N	ID	ND	ppbV	NC	25
Bromomethane		N	ID	ND	ppbV	NC	25
Carbon tetrachloride		N	ID	ND	ppbV	NC	25
Chlorobenzene		N	ID	ND	ppbV	NC	25



L0615161

## Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

ontrol Lab Number:

**Report Date:** 11/07/06

arameter	Native Sample	Duplicate Sar	nple Units	RPD	RPD Limits
platile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID	: WG259413-2	QC Sample: L0614538	-06 Client ID:	DUP Sample
Chloroethane	ND	ND	ppbV	NC	25
Chloroform	ND	ND	ppbV	NC	25
Chloromethane	0.526	0.542	ppbV	3	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Dichlorodifluoromethane	ND	ND	ppbV	NC	25
Ethylbenzene	ND	ND	ppbV	NC	25
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ppbV	NC	25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ppbV	NC	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25
Methylene chloride	ND	ND	ppbV	NC	25
p/m-Xylene	ND	ND	ppbV	NC	25
o-Xylene	ND	ND	ppbV	NC	25
Styrene	ND	ND	ppbV	NC	25
Tetrachloroethene	ND	ND	ppbV	NC	25
Toluene	1.54	1.45	ppbV	6	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichloroethene	ND	ND	ppbV	NC	25



# Lab Duplicate Analysis Batch Quality Control

Project Name: OLIN Batch Quality Co

Lab Number:

L0615161

Report Date:

11/07/06

<u>Parameter</u>	Native	Sample	Duplicate Sa	ample Units	RPD	RPD Limits
Volatile Organic Compounds in Air A	Associated sample(s): 01-02	QC Batch ID:	WG259413-2	QC Sample: L061453	8-06 Client ID:	DUP Sample
Trichlorofluoromethane	N	ND	ND	ppbV	NC	25
Vinyl chloride	N	ND	ND	ppbV	NC	25

Project Name: OLIN Lab Number: L0615161

Project Number: 681076 Report Date: 11/07/06

**SAMPLE RESULTS** 

Lab ID: Date Collected: 10/20/06 12:15

Client ID: EFFLUENT Date Received: 10/23/06
Sample Location: WILMINGTON, MA Field Prep: None

Matrix: Air

Analytical Method: 43,DRAFT 1 Analytical Date: 11/04/06 14:26

Analyst: PS

#### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone:

Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Were all QA/QC procedures REQUIRED by the method followed?

Were all performance/acceptance standards for the required procedures achieved?

No

Were significant modifications made to the method as specified in Sect 11.3?

Parameter	Result	Qualifier	Units	RDL	Dilution Fact
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	46.2		ug/m3	24.0	1
C9-C12 Aliphatics	85.1		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	43.0		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	82.1		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0615161

 Project Number:
 681076
 Report Date:
 11/07/06

Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 11/04/06 09:38

Analyst: PS

Parameter	Result	Qι	ıalifier	Units	RDL
Petroleum Hydrocarbons in Air for	sample(s):	02	Batch:	WG259557-3	3
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: OLIN
Project Number: 681076

Lab Number:

L0615161

Report Date:

11/07/06

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated s	ample(s): 02 Ba	tch: WG259557-1			
1,3-Butadiene	100	-	70-130	-	
Methyl tert butyl ether	92	-	70-130	-	
Benzene	84	-	70-130	-	
Toluene	78	-	70-130	-	
Ethylbenzene	95	-	70-130	-	
p/m-Xylene	88	-	70-130	-	
o-Xylene	94	-	70-130	-	
Naphthalene	70	-	70-130	-	
2-Methylnaphthalene	54	-	70-130	-	
C5-C8 Aliphatics, Adjusted	93	-	70-130	-	
C9-C12 Aliphatics, Adjusted	88	-	70-130	-	
C9-C10 Aromatics	95	-	70-130	-	

**Project Name:** OLIN **Project Number:** 681076 Lab Number:

L0615161 11/07/06

Report Date:

rameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s):	02 QC Batch ID: WG2	259557-2 QC Sample:	L0615163-01	Client ID: DUP Sa	ample
C5-C8 Aliphatics	151	172	ug/m3	13	30
C9-C12 Aliphatics	644	708	ug/m3	9	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	4.38	5.02	ug/m3	14	30
Toluene	12.9	15.3	ug/m3	17	30
Ethylbenzene	7.24	8.80	ug/m3	19	30
p/m-Xylene	15.8	18.0	ug/m3	13	30
o-Xylene	5.84	6.74	ug/m3	14	30
Naphthalene	8.02	6.50	ug/m3	21	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	103	116	ug/m3	12	30
C9-C12 Aliphatics, Adjusted	541	588	ug/m3	8	30
C9-C10 Aromatics	95.3	114	ug/m3	18	30

**Project Name:** OLIN **Lab Number:** L0615161

Project Number: 681076 **Report Date:** 11/07/06

**Sample Receipt and Container Information** 

YES Were project specific reporting limits specified?

**Cooler Information** 

Cooler **Custody Seal** 

**Container Information** 

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0615161-01A	Canister - 2.7 Liter	NA	NA	NA	Υ	Absent	TO-14
L0615161-02A	Canister - 2.7 Liter	NA	NA	NA	Υ	Absent	APH,TO-14



Project Name:OLINLab Number:L0615161Project Number:681076Report Date:11/07/06

#### **GLOSSARY**

#### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified



Project Name:OLINLab Number:L0615161Project Number:681076Report Date:11/07/06

#### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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#### ANALYTICAL REPORT

Lab Number: L0700395

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 01/30/07



 Project Name:
 OLIN
 Lab Number:
 L0700395

 Project Number:
 681076
 Report Date:
 01/30/07

Alpha Sample IDClient IDSample LocationL0700395-01PRECARBONWILMINGTON, MAL0700395-02EFFLUENTWILMINGTON, MA

 Project Name:
 OLIN
 Lab Number:
 L0700395

 Project Number:
 681076
 Report Date:
 01/30/07

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

Volatile Organic Compounds in Air

L0700395-01 has elevated detection limits due to the 10x dilution required by the elevated concentrations of target compounds in the sample.

The LCS % recoveries are below method acceptance criteria for 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1,2-Dichlorobenzene and Hexachlorobutadiene.

Petroleum Hydrocarbons in Air

L0700395-02: Acetone and a silane isomer are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director

Date: 01/30/07



### **AIR**



Project Name: OLIN Lab Number: L0700395

Project Number: 681076 Report Date: 01/30/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 01/10/07 10:45

Client ID: PRECARBON Date Received: 01/11/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 01/26/07 20:37

Analyst: PS

	ppb\	<u>/</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	5.00	ND	27.2		10
1,1,2,2-Tetrachloroethane	ND	5.00	ND	34.3		10
1,1,2-Trichloroethane	ND	5.00	ND	27.2		10
1,1-Dichloroethane	ND	5.00	ND	20.2		10
1,1-Dichloroethene	ND	5.00	ND	19.8		10
1,2,4-Trichlorbenzene	ND	5.00	ND	37.1		10
1,2,4-Trimethylbenzene	ND	5.00	ND	24.6		10
1,2-Dibromoethane	ND	5.00	ND	38.4		10
1,2-Dichlorobenzene	ND	5.00	ND	30.0		10
1,2-Dichloroethane	ND	5.00	ND	20.2		10
1,2-Dichloropropane	ND	5.00	ND	23.1		10
1,3,5-Trimethybenzene	ND	5.00	ND	24.6		10
1,3-Dichlorobenzene	ND	5.00	ND	30.0		10
1,4-Dichlorobenzene	ND	5.00	ND	30.0		10
Benzene	ND	5.00	ND	16.0		10
Benzyl chloride	ND	5.00	ND	25.9		10
Bromomethane	ND	5.00	ND	19.4		10
Carbon tetrachloride	ND	5.00	ND	31.4		10
Chlorobenzene	ND	5.00	ND	23.0		10
Chloroethane	ND	5.00	ND	13.2		10
Chloroform	ND	5.00	ND	24.4		10
Chloromethane	ND	5.00	ND	10.3		10
cis-1,2-Dichloroethene	ND	5.00	ND	19.8		10
cis-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Dichlorodifluoromethane	ND	10.0	ND	49.4		10



Project Name: OLIN Lab Number: L0700395

Project Number: 681076 Report Date: 01/30/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 01/10/07 10:45

Client ID: PRECARBON Date Received: 01/11/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppbV	•	ug/m3	}		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	5.00	ND	21.7		10
Freon-113	ND	5.00	ND	38.3		10
Freon-114	ND	5.00	ND	34.9		10
Hexachlorobutadiene	ND	5.00	ND	53.3		10
Methylene chloride	ND	10.0	ND	34.7		10
p/m-Xylene	ND	10.0	ND	43.4		10
o-Xylene	ND	5.00	ND	21.7		10
Styrene	ND	5.00	ND	21.3		10
Tetrachloroethene	ND	5.00	ND	33.9		10
Toluene	ND	5.00	ND	18.8		10
trans-1,2-Dichloroethene	ND	5.00	ND	19.8		10
trans-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Trichloroethene	ND	5.00	ND	26.8		10
Trichlorofluoromethane	ND	5.00	ND	28.1		10
Vinyl chloride	ND	5.00	ND	12.8		10
2,4,4-trimethyl-2-pentene	64.2	5.00	294	22.9		10
2,4,4-trimethyl-1-pentene	546	5.00	2500	22.9		10



Project Name: OLIN Lab Number: L0700395

Project Number: 681076 Report Date: 01/30/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 01/10/07 10:30

Client ID: EFFLUENT Date Received: 01/11/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 01/26/07 18:52

Analyst: PS

	ppbV ug/m3		<u> </u>		Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	6.66	0.500	21.2	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0700395

Project Number: 681076 Report Date: 01/30/07

### **SAMPLE RESULTS**

 Lab ID:
 L0700395-02
 Date Collected:
 01/10/07 10:30

 Client ID:
 EFFLUENT
 Date Received:
 01/11/07

Client ID: EFFLUENT Date Received: 01/11/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppb\	<u>′                                    </u>	ug/m	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	1.29	1.00	5.62	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	4.89	0.500	18.4	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	ND	0.500	ND	2.29		1



Project Name: OLIN Lab Number: L0700395

Project Number: 681076 Report Date: 01/30/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 01/26/07 18:16

	ppb	V	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	sample(s):	01-02 Batch:	WG268863-3			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0700395

Project Number: 681076 Report Date: 01/30/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 01/26/07 18:16

	ppb	<u>v</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	01-02 Batch:	WG268863-3			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	ND	0.500	ND	2.29		1



Project Name: OLIN
Project Number: 681076

Lab Number: L0700395

**Report Date:** 01/30/07

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air A	associated sample(s): 01-	02 Batch: WG268863-1			
1,1,1-Trichloroethane	99	-	70-130	-	
1,1,2,2-Tetrachloroethane	106	-	70-130	-	
1,1,2-Trichloroethane	114	-	70-130	-	
1,1-Dichloroethane	102	-	70-130	-	
1,1-Dichloroethene	72	-	70-130	-	
1,2,4-Trichlorobenzene	88	-	70-130	-	
1,2,4-Trimethylbenzene	84	-	70-130	-	
1,2-Dibromoethane	126	-	70-130	-	
1,2-Dichlorobenzene	50	-	70-130	-	
1,2-Dichloroethane	89	-	70-130	-	
1,2-Dichloropropane	112	-	70-130	-	
1,3,5-Trimethylbenzene	104	-	70-130	-	
1,3-Dichlorobenzene	67	-	70-130	-	
1,4-Dichlorobenzene	58	-	70-130	-	
Benzene	105	-	70-130	-	
Benzyl chloride	83	-	70-130	-	
Bromomethane	71	-	70-130	-	
Carbon tetrachloride	100	-	70-130	-	
Chlorobenzene	125	-	70-130	-	
Chloroethane	73	-	70-130	-	
Chloroform	94	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0700395

**Report Date:** 01/30/07

ameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
atile Organic Compounds in Air Associa	ited sample(s): 01-02	Batch: WG268863-1			
Chloromethane	74	-	70-130	-	
cis-1,2-Dichloroethene	99	-	70-130	-	
cis-1,3-Dichloropropene	114	-	70-130	-	
Dichlorodifluoromethane	81	-	70-130	-	
Ethylbenzene	104	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	77	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	78	-	70-130	-	
Hexachlorobutadiene	61	-	70-130	-	
Methylene chloride	72	-	70-130	-	
p/m-Xylene	117	-	70-130	-	
o-Xylene	108	-	70-130	-	
Styrene	106	-	70-130	-	
Tetrachloroethene	107	-	70-130	-	
Toluene	125	-	70-130	-	
trans-1,2-Dichloroethene	118	-	70-130	-	
trans-1,3-Dichloropropene	116	-	70-130	-	
Trichloroethene	100	-	70-130	-	
Trichlorofluoromethane	76	-	70-130	-	
Vinyl bromide	92	-	70-130	-	
Vinyl chloride	71	-	70-130	-	



Project Name: OLIN Batch Qua

Lab Number: L0700395

**Report Date:** 01/30/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Asso	ociated sample(s): 01-02	Batch: WG268863-4			
Tetrachloroethene	114	-	70-130	-	



**Project Number:** 

681076

**Project Name:** OLIN Project Number: 681076 Lab Number: L0700395

01/30/07 Report Date:

arameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associated	d sample(s): 01-02 QC Batch ID:	WG268863-2	QC Sample: L0700395	-02 Client ID:	EFFLUENT
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorbenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	ND	ND	ppbV	NC	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
Benzene	6.66	6.37	ppbV	4	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25



Project Name: OLIN
Project Number: 681076

uality Control Lab Number:

umber: L0700395

**Report Date:** 01/30/07

arameter	Na Na	tive Sample	Duplicate Sa	ample Units	RPD	RPD Limits
olatile Organic Compounds in Air A	Associated sample(s): 01	I-02 QC Batch ID:	WG268863-2	QC Sample: L0700395	-02 Client ID:	EFFLUENT
Chloroethane		ND	ND	ppbV	NC	25
Chloroform		ND	ND	ppbV	NC	25
Chloromethane		ND	ND	ppbV	NC	25
cis-1,2-Dichloroethene		ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene		ND	ND	ppbV	NC	25
Dichlorodifluoromethane		ND	ND	ppbV	NC	25
Ethylbenzene		ND	ND	ppbV	NC	25
Freon-113		ND	ND	ppbV	NC	25
Freon-114		ND	ND	ppbV	NC	25
Hexachlorobutadiene		ND	ND	ppbV	NC	25
Methylene chloride		ND	ND	ppbV	NC	25
p/m-Xylene		1.29	1.08	ppbV	18	25
o-Xylene		ND	ND	ppbV	NC	25
Styrene		ND	ND	ppbV	NC	25
Tetrachloroethene		ND	ND	ppbV	NC	25
Toluene		4.89	4.36	ppbV	11	25
trans-1,2-Dichloroethene		ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene		ND	ND	ppbV	NC	25
Trichloroethene		ND	ND	ppbV	NC	25



Lab Number:

L0700395

Report Date:

01/30/07

Parameter	Native Sample	Duplicate Sample	e Units	RPD	RPD Limits
Volatile Organic Compounds in Air Ass	sociated sample(s): 01-02 QC Batch ID:	WG268863-2 QC	Sample: L0700395	-02 Client ID:	EFFLUENT
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-trimethyl-2-pentene	ND	ND	ppbV	NC	25
2,4,4-trimethyl-1-pentene	ND	ND	ppbV	NC	25

**Project Name:** 

**Project Number:** 

OLIN

681076

**Project Name:** OLIN Project Number: 681076

Lab Number:

L0700395

Report Date:

01/30/07

arameter	Native	e Sample	Duplicate Sa	ample Units	RPD	RPD Limits
platile Organic Compounds in Air As	ssociated sample(s): 01-02	QC Batch ID:	WG268863-6	QC Sample: L0700996-	01 Client ID:	DUP Sample
1,1,1-Trichloroethane		ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane		ND	ND	ppbV	NC	25
1,1,2-Trichloroethane		ND	ND	ppbV	NC	25
1,1-Dichloroethane		ND	ND	ppbV	NC	25
1,1-Dichloroethene		ND	ND	ppbV	NC	25
1,2,4-Trichlorbenzene		ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene		ND	ND	ppbV	NC	25
1,2-Dibromoethane		ND	ND	ppbV	NC	25
1,2-Dichlorobenzene		ND	ND	ppbV	NC	25
1,2-Dichloroethane		ND	ND	ppbV	NC	25
1,2-Dichloropropane		ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene		ND	ND	ppbV	NC	25
1,3-Dichlorobenzene		ND	ND	ppbV	NC	25
1,4-Dichlorobenzene		ND	ND	ppbV	NC	25
Benzene		1.03	1.05	ppbV	2	25
Benzyl chloride		ND	ND	ppbV	NC	25
Bromomethane		ND	ND	ppbV	NC	25
Carbon tetrachloride		ND	ND	ppbV	NC	25
Chlorobenzene		ND	ND	ppbV	NC	25



L0700395

# Lab Duplicate Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

iality Control Lab Number:

**Report Date:** 01/30/07

arameter	Nativ	re Sample	Duplicate Sa	ample Units	RPD	RPD Limits
olatile Organic Compounds in Air Ass	ociated sample(s): 01-0	2 QC Batch ID	: WG268863-6	QC Sample: L0700996	6-01 Client ID:	DUP Sample
Chloroethane		ND	ND	ppbV	NC	25
Chloroform		ND	ND	ppbV	NC	25
Chloromethane		1.13	1.20	ppbV	6	25
cis-1,2-Dichloroethene		34.0	35.6	ppbV	5	25
cis-1,3-Dichloropropene		ND	ND	ppbV	NC	25
Dichlorodifluoromethane		ND	ND	ppbV	NC	25
Ethylbenzene		ND	ND	ppbV	NC	25
Freon-113		ND	ND	ppbV	NC	25
Freon-114		ND	ND	ppbV	NC	25
Hexachlorobutadiene		ND	ND	ppbV	NC	25
Methylene chloride		ND	ND	ppbV	NC	25
p/m-Xylene		ND	ND	ppbV	NC	25
o-Xylene		ND	ND	ppbV	NC	25
Styrene		ND	ND	ppbV	NC	25
Tetrachloroethene		245	215	ppbV	13	25
Toluene		ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene		1.16	1.26	ppbV	8	25
trans-1,3-Dichloropropene		ND	ND	ppbV	NC	25
Trichloroethene		47.2	48.1	ppbV	2	25



Project Name: OLIN Batch Quality Control Project Number: 681076

Lab Number:

L0700395

Report Date:

01/30/07

Parameter	Native Sample	Duplicate Samp	ole Units	RPD	RPD Limits
Volatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG268863-6 QC	C Sample: L0700996-01	Client ID:	DUP Sample
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	2.24	2.35	ppbV	5	25

OLIN L0700395 **Project Name:** Lab Number:

**Project Number:** 681076 **Report Date:** 01/30/07

**SAMPLE RESULTS** 

Lab ID: L0700395-02 Date Collected: 01/10/07 10:30

Date Received: Client ID: **EFFLUENT** 01/11/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified Matrix:

Anaytical Method: 43,DRAFT 1

Air

Analytical Date: 01/22/07 21:27

Analyst: НМ

### **Quality Control Information**

Sample Type: Grab

Canister - 2.7 Liter Sample Container Type:

Sampling Flow Controller: Mechanical

Sampling Zone: Unknown Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%

Were all QA/QC procedures REQUIRED by the method followed? Yes Were all performance/acceptance standards for the required procedures achieved? Yes

Were significant modifications made to the method as specified in Sect 11.3? No

Parameter	Result	Qualifier	Units	RDL	Dilution Facto
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	239		ug/m3	24.0	1
C9-C12 Aliphatics	178		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	15.2		ug/m3	2.00	1
Toluene	15.4		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	5.97		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	200		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	174		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1

 Project Name:
 OLIN
 Lab Number:
 L0700395

 Project Number:
 681076
 Report Date:
 01/30/07

Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 01/22/07 10:09

Analyst: HM

Parameter	Result	Qι	ıalifier	Units	RDL
Petroleum Hydrocarbons in Air for	sample(s):	02	Batch:	WG268308-2	
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: OLIN
Project Number: 681076

Lab Number: L0700395

**Report Date:** 01/30/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Petroleum Hydrocarbons in Air As	ssociated sample(s): 02 I	Batch: WG268308-1			
1,3-Butadiene	90	-	70-130	-	
Methyl tert butyl ether	108	-	70-130	-	
Benzene	98	-	70-130	-	
Toluene	102	-	70-130	-	
Ethylbenzene	104	-	70-130	-	
p/m-Xylene	101	-	70-130	-	
o-Xylene	105	-	70-130	-	
Naphthalene	95	-	70-130	-	
2-Methylnaphthalene	82	-	70-130	-	
C5-C8 Aliphatics, Adjusted	98	-	70-130	-	
C9-C12 Aliphatics, Adjusted	98	-	70-130	-	
C9-C10 Aromatics	108	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0700395

**Report Date:** 01/30/07

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s	e): 02 QC Batch ID: WG2	68308-3 QC Sample: I	_0700733-04 C	lient ID: DUP Sa	ample
C5-C8 Aliphatics	102	101	ug/m3	1	30
C9-C12 Aliphatics	165	164	ug/m3	1	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	25.0	25.2	ug/m3	1	30
Benzene	2.17	2.13	ug/m3	2	30
Toluene	5.77	5.74	ug/m3	1	30
Ethylbenzene	ND	ND	ug/m3	NC	30
p/m-Xylene	ND	ND	ug/m3	NC	30
o-Xylene	2.14	2.14	ug/m3	0	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	64.4	62.9	ug/m3	2	30
C9-C12 Aliphatics, Adjusted	153	152	ug/m3	1	30
C9-C10 Aromatics	ND	ND	ug/m3	NC	30

Project Name: OLIN Lab Number: L0700395

Project Number: 681076 Report Date: 01/30/07

### **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Cooler Information** 

Cooler Custody Seal NA Absent

### **Container Information**

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0700395-01A	Canister - 2.7 Liter	NA	NA	NA	NA	Absent	TO-14
L0700395-02A	Canister - 2.7 Liter	NA	NA	NA	NA	Absent	APH,TO-14



 Project Name:
 OLIN
 Lab Number:
 L0700395

 Project Number:
 681076
 Report Date:
 01/30/07

#### **GLOSSARY**

#### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified



Project Name:OLINLab Number:L0700395Project Number:681076Report Date:01/30/07

#### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Maria .		IALYSIS	5 ,	AGEC	)F	Date Re	c'd in Lab	: 1   11	107		A	LPH.	A Job	#: L0700395	
Eight Walkup Drive Westborough, MA 01581		Project Information				Report Information - Data Deliverables						Billing Information			
TEL: 508-898-9220	Project Name: 8/110				☐ FAX ☐ ADEx Criteria Checker: (Default based on Regulatory Criteria Indicated) Other Formats: ☐ EMAIL (standard pdf report) ☐ Additional Deliverables:						☐ Same as Client info PO #:				
Client Information	Project Location: W. In Justan WA														
Client: SAc	Project #: 69/07k2											, e e que			
Address: /OcTechno logy center di.		Project Manager: Dave Cobb								-	Regulatory Requirements/Report Limits State/Fed Program Criteria				
	ALPHA Quote #:														
Stoughton, MH 82872 Phone: 617 589 5067		Turn-Around Time				Report to: (if different than Project Manager)					-				
Fax:															
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Page 27 of 28

# Alpha Analytical Labs Sample Delivery Group Form

Laboratory Job No. <u>L0700396</u>	SDG Reviewer Flaly								
Client: Shaw EFI	Date/Time: 1)11 / 0	7 1400							
Preliminary Review									
1. Samples Delivered via:	2. Chain of Custody:	3. Custody Seal:							
☐ Alpha Courier ☐ Express Mail ☐ Other	☐ Present☐ Absent	Absent Present/Intact							
3. All Containers Accounted for:		Present/Broken							
☐ Yes ☐ No									
4. Samples received:									
☐ Intact ☐ Extra;		***************************************							
Broken Sample IDs :									
Leaking Sample IDs :									
5. Temperature Blank: N/A Air Samples									
Present Temperature (in Celsius):	2 - 6 Celsius degrees								
Absent Is the ice (n blue ice) present?	Yes Cooler T	Гетр:							
Secondary Review									
1. Do the sample(s) labels and Chain of Custody ag	gree?								
	gree?								
2. Are the samples in appropriate containers?									
2. Are the samples in appropriate containers?  Yes									
2. Are the samples in appropriate containers?  Yes									
2. Are the samples in appropriate containers?  Yes									

\* Contact client and attach the phone log

Form No.: 01-02

01/07/2003



#### ANALYTICAL REPORT

Lab Number: L0702947

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 03/19/07



 Project Name:
 OLIN
 Lab Number:
 L0702947

 Project Number:
 681076
 Report Date:
 03/19/07

Alpha Sample IDClient IDSample LocationL0702947-01PRECARBONWILMINGTON, MAL0702947-02EFFLUENTWILMINGTON, MA

Project Name:OLINLab Number:L0702947Project Number:681076Report Date:03/19/07

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

Volatile Organic Compounds in Air

L0702947-01: The canister was pressurized with UHP Nitrogen due to high compound concentrations. The addition of Nitrogen resulted in a dilution of the sample. The reporting limits have been elevated accordingly. L0702947-01 has elevated detection limits due to the 20x dilution required by the elevated concentrations of target compounds in the sample.

Re-analysis on dilution was required in order to quantitate samples within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis.

The re-analysis was performed only for the compound which exceeded the range of the calibration. The dilutions are as follows:

L0702947-01: 319.2x L0702947-02: 2x

The laboratory duplicate RPD is above method acceptance criteria for Methylene chloride.

Petroleum Hydrocarbons in Air

L0702947-02: Acetone and Methylene chloride are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director

Date: 03/19/07



## **AIR**



Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 02/28/07 10:30

Client ID: PRECARBON Date Received: 03/01/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 03/15/07 23:32

Analyst: Al

	ppbV	<u>'</u>	ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	10.0	ND	54.5		20
1,1,2,2-Tetrachloroethane	ND	10.0	ND	68.6		20
1,1,2-Trichloroethane	ND	10.0	ND	54.5		20
1,1-Dichloroethane	ND	10.0	ND	40.4		20
1,1-Dichloroethene	ND	10.0	ND	39.6		20
1,2,4-Trichlorbenzene	ND	10.0	ND	74.2		20
1,2,4-Trimethylbenzene	ND	10.0	ND	49.1		20
1,2-Dibromoethane	ND	10.0	ND	76.8		20
1,2-Dichlorobenzene	ND	10.0	ND	60.1		20
1,2-Dichloroethane	ND	10.0	ND	40.4		20
1,2-Dichloropropane	ND	10.0	ND	46.2		20
1,3,5-Trimethybenzene	ND	10.0	ND	49.1		20
1,3-Dichlorobenzene	ND	10.0	ND	60.1		20
1,4-Dichlorobenzene	ND	10.0	ND	60.1		20
Benzene	ND	10.0	ND	31.9		20
Benzyl chloride	ND	10.0	ND	51.7		20
Bromomethane	ND	10.0	ND	38.8		20
Carbon tetrachloride	ND	10.0	ND	62.9		20
Chlorobenzene	ND	10.0	ND	46.0		20
Chloroethane	ND	10.0	ND	26.4		20
Chloroform	ND	10.0	ND	48.8		20
Chloromethane	ND	10.0	ND	20.6		20
cis-1,2-Dichloroethene	ND	10.0	ND	39.6		20
cis-1,3-Dichloropropene	ND	10.0	ND	45.3		20
Dichlorodifluoromethane	ND	20.0	ND	98.8		20



Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

### **SAMPLE RESULTS**

 Lab ID:
 L0702947-01
 Date Collected:
 02/28/07 10:30

 Client ID:
 PRECARBON
 Date Received:
 03/01/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppbV	<u> </u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	10.0	ND	43.4		20
Freon-113	ND	10.0	ND	76.6		20
Freon-114	ND	10.0	ND	69.8		20
Hexachlorobutadiene	ND	10.0	ND	106.		20
Methylene chloride	ND	20.0	ND	69.4		20
p/m-Xylene	ND	20.0	ND	86.8		20
o-Xylene	ND	10.0	ND	43.4		20
Styrene	ND	10.0	ND	42.6		20
Tetrachloroethene	ND	10.0	ND	67.8		20
Toluene	ND	10.0	ND	37.6		20
trans-1,2-Dichloroethene	ND	10.0	ND	39.6		20
trans-1,3-Dichloropropene	ND	10.0	ND	45.3		20
Trichloroethene	ND	10.0	ND	53.7		20
Trichlorofluoromethane	ND	10.0	ND	56.1		20
Vinyl chloride	ND	10.0	ND	25.5		20
2,4,4-trimethyl-2-pentene	>200	10	>917	45.8		20
2,4,4-trimethyl-1-pentene	>200	10	>917	45.8		20



Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

**SAMPLE RESULTS** 

Lab ID: L0702947-01 R Date Collected: 02/28/07 10:30

Client ID: PRECARBON Date Received: 03/01/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 03/16/07 08:53

Analyst: Al

	ppbV		ug/m3		Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
2,4,4-trimethyl-2-pentene	227	160	1040	732		319.2
2,4,4-trimethyl-1-pentene	1900	160	8740	732		319.2



Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 02/28/07 10:45

Client ID: EFFLUENT Date Received: 03/01/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 03/15/07 22:25

Analyst: Al

	ppbV	<u>'</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	5.40	0.500	14.2	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	1.17	0.500	2.41	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	1.36	1.00	6.72	4.94		1



Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 02/28/07 10:45

Client ID: EFFLUENT Date Received: 03/01/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

nh\/		_		
ppbV		ug/m3		Dilution
s RDL	Results	RDL	Qualifier	Factor
0.500	ND	2.17		1
0.500	ND	3.83		1
0.500	ND	3.49		1
0.500	ND	5.33		1
1	>34.74	3.47		1
1.00	ND	4.34		1
0.500	ND	2.17		1
0.500	ND	2.13		1
0.500	ND	3.39		1
0.500	ND	1.88		1
0.500	ND	1.98		1
0.500	ND	2.27		1
0.500	ND	2.68		1
0.500	ND	2.81		1
0.500	ND	1.28		1
0.500	ND	2.29		1
0.500	ND	2.29		1
	0.500 0.500 0.500 0.500 1 1.00 0.500 0.500 0.500 0.500 0.500 0.500 0.500 0.500 0.500 0.500 0.500	0.500 ND 0.500 ND 0.500 ND 0.500 ND 1 >34.74 1.00 ND 0.500 ND	Ros         Results         RDL           0.500         ND         2.17           0.500         ND         3.83           0.500         ND         3.49           0.500         ND         5.33           1         >34.74         3.47           1.00         ND         4.34           0.500         ND         2.17           0.500         ND         2.13           0.500         ND         3.39           0.500         ND         1.88           0.500         ND         1.98           0.500         ND         2.27           0.500         ND         2.81           0.500         ND         1.28           0.500         ND         2.29	Results RDL Qualifier  0.500 ND 2.17  0.500 ND 3.83  0.500 ND 5.33  1 >34.74 3.47  1.00 ND 4.34  0.500 ND 2.17  0.500 ND 2.17  0.500 ND 3.39  0.500 ND 1.88  0.500 ND 1.98  0.500 ND 2.27  0.500 ND 2.68  0.500 ND 2.81  0.500 ND 1.28  0.500 ND 2.29



Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

**SAMPLE RESULTS** 

Lab ID: L0702947-02 R Date Collected: 02/28/07 10:45

Client ID: EFFLUENT Date Received: 03/01/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 03/16/07 08:19

Analyst: Al

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Methylene chloride	14.4	2.00	49.8	6.94		2



Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 03/15/07 17:38

	ppb	<u>v</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	sample(s):	01-02 Batch:	WG273473-2			
1,1,1-Trichloroethane	ND	0.312	ND	1.70		.625
1,1,2,2-Tetrachloroethane	ND	0.312	ND	2.14		.625
1,1,2-Trichloroethane	ND	0.312	ND	1.70		.625
1,1-Dichloroethane	ND	0.312	ND	1.26		.625
1,1-Dichloroethene	ND	0.312	ND	1.24		.625
1,2,4-Trichlorbenzene	ND	0.312	ND	2.32		.625
1,2,4-Trimethylbenzene	ND	0.312	ND	1.54		.625
1,2-Dibromoethane	ND	0.312	ND	2.40		.625
1,2-Dichlorobenzene	ND	0.312	ND	1.88		.625
1,2-Dichloroethane	ND	0.312	ND	1.26		.625
1,2-Dichloropropane	ND	0.312	ND	1.44		.625
1,3,5-Trimethybenzene	ND	0.312	ND	1.54		.625
1,3-Dichlorobenzene	ND	0.312	ND	1.88		.625
1,4-Dichlorobenzene	ND	0.312	ND	1.88		.625
Benzene	ND	0.312	ND	0.998		.625
Benzyl chloride	ND	0.312	ND	1.62		.625
Bromomethane	ND	0.312	ND	1.21		.625
Carbon tetrachloride	ND	0.312	ND	1.96		.625
Chlorobenzene	ND	0.312	ND	1.44		.625
Chloroethane	ND	0.312	ND	0.824		.625
Chloroform	ND	0.312	ND	1.52		.625
Chloromethane	ND	0.312	ND	0.645		.625
cis-1,2-Dichloroethene	ND	0.312	ND	1.24		.625
cis-1,3-Dichloropropene	ND	0.312	ND	1.42		.625
Dichlorodifluoromethane	ND	0.625	ND	3.09		.625



Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 03/15/07 17:38

	ppb	<u>v</u>	<u>ug/m3</u>			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	01-02 Batch:	WG273473-2			
Ethylbenzene	ND	0.312	ND	1.36		.625
Freon-113	ND	0.312	ND	2.39		.625
Freon-114	ND	0.312	ND	2.18		.625
Hexachlorobutadiene	ND	0.312	ND	3.33		.625
Methylene chloride	ND	0.625	ND	2.17		.625
p/m-Xylene	ND	0.625	ND	2.71		.625
o-Xylene	ND	0.312	ND	1.36		.625
Styrene	ND	0.312	ND	1.33		.625
Tetrachloroethene	ND	0.312	ND	2.12		.625
Toluene	ND	0.312	ND	1.18		.625
trans-1,2-Dichloroethene	ND	0.312	ND	1.24		.625
trans-1,3-Dichloropropene	ND	0.312	ND	1.42		.625
Trichloroethene	ND	0.312	ND	1.68		.625
Trichlorofluoromethane	ND	0.312	ND	1.75		.625
Vinyl chloride	ND	0.312	ND	0.798		.625
2,4,4-trimethyl-2-pentene	ND	0.312	ND	1.43		.625
2,4,4-trimethyl-1-pentene	ND	0.312	ND	1.43		.625



Project Name: OLIN
Project Number: 681076

Lab Number: L0702947

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air A	Associated sample(s): 01-0	2 Batch: WG273473-1			
1,1,1-Trichloroethane	84	-	70-130	-	
1,1,2,2-Tetrachloroethane	89	-	70-130	-	
1,1,2-Trichloroethane	82	-	70-130	-	
1,1-Dichloroethane	89	-	70-130	-	
1,1-Dichloroethene	92	-	70-130	-	
1,2,4-Trichlorobenzene	84	-	70-130	-	
1,2,4-Trimethylbenzene	88	-	70-130	-	
1,2-Dibromoethane	83	-	70-130	-	
1,2-Dichlorobenzene	83	-	70-130	-	
1,2-Dichloroethane	83	-	70-130	-	
1,2-Dichloropropane	80	-	70-130	-	
1,3,5-Trimethylbenzene	85	-	70-130	-	
1,3-Butadiene	84	-	70-130	-	
1,3-Dichlorobenzene	84	-	70-130	-	
1,4-Dichlorobenzene	82	-	70-130	-	
1,4-Dioxane	85	-	70-130	-	
2,2,4-Trimethylpentane	89	-	70-130	-	
2-Butanone	86	-	70-130	-	
2-Hexanone	81	-	70-130	-	
3-Chloropropene	91	-	70-130	-	
4-Ethyltoluene	82	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0702947

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	d sample(s): 01-02	2 Batch: WG273473-1			
Acetone	78	-	70-130	-	
Benzene	87	-	70-130	-	
Benzyl chloride	72	-	70-130	-	
Bromodichloromethane	80	-	70-130	-	
Bromoform	80	-	70-130	-	
Bromomethane	86	-	70-130	-	
Carbon disulfide	92	-	70-130	-	
Carbon tetrachloride	86	-	70-130	-	
Chlorobenzene	83	-	70-130	-	
Chloroethane	82	-	70-130	-	
Chloroform	86	-	70-130	-	
Chloromethane	89	-	70-130	-	
cis-1,2-Dichloroethene	83	-	70-130	-	
cis-1,3-Dichloropropene	73	-	70-130	-	
Cyclohexane	90	-	70-130	-	
Dibromochloromethane	81	-	70-130	-	
Dichlorodifluoromethane	86	-	70-130	-	
Ethyl Alcohol	81	-	70-130	-	
Ethyl Acetate	91	-	70-130	-	
Ethylbenzene	83	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	92	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number: L0702947

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Assoc	ciated sample(s): 01-02	Batch: WG273473-1			
1,2-Dichloro-1,1,2,2-tetrafluoroethane	89	-	70-130	-	
Hexachlorobutadiene	83	-	70-130	-	
iso-Propyl Alcohol	95	-	70-130	-	
Methylene chloride	81	-	70-130	-	
4-Methyl-2-pentanone	78	-	70-130	-	
Methyl tert butyl ether	85	-	70-130	-	
p/m-Xylene	80	-	70-130	-	
o-Xylene	83	-	70-130	-	
n-Hexane	86	-	70-130	-	
Propylene	90	-	70-130	-	
Styrene	80	-	70-130	-	
Tetrachloroethene	87	-	70-130	-	
Tetrahydrofuran	87	-	70-130	-	
Toluene	87	-	70-130	-	
trans-1,2-Dichloroethene	89	-	70-130	-	
trans-1,3-Dichloropropene	74	-	70-130	-	
Trichloroethene	84	-	70-130	-	
Trichlorofluoromethane	108	-	70-130	-	
Vinyl acetate	81	-	70-130	-	
Vinyl bromide	93	-	70-130	-	
Vinyl chloride	91	-	70-130	-	



**Project Name:** OLIN **Project Number:** 681076

Lab Number:

L0702947

Report Date:

03/19/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Associate	ed sample(s): 01-02	Batch: WG273473-1			
1,2,3-Trichloropropane	86	-	70-130	-	
Naphthalene	94	-	70-130	-	
1,2,3-Trichlorobenzene	79	-	70-130	-	

L0702947

## Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

Quality Control Lab Number:

Parameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits
Volatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG273473-3	QC Sample: L0702947-0	2 Client ID:	: EFFLUENT
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorbenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	ND	ND	ppbV	NC	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
Benzene	ND	ND	ppbV	NC	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25



# Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

Lab Number:

L0702947 03/19/07

Report Date:

Parameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits
Volatile Organic Compounds in Air Associated sampl	e(s): 01-02 QC Batch ID	): WG273473-3	QC Sample: L0702947	'-02 Client ID:	EFFLUENT
Chloroethane	5.40	5.52	ppbV	3	25
Chloroform	ND	ND	ppbV	NC	25
Chloromethane	1.17	1.24	ppbV	2	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Dichlorodifluoromethane	1.36	1.42	ppbV	4.3	25
Ethylbenzene	ND	ND	ppbV	NC	25
Freon-113	ND	ND	ppbV	NC	25
Freon-114	ND	ND	ppbV	NC	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25
Methylene chloride	>10	>10	ppbV	NC	25
p/m-Xylene	ND	ND	ppbV	NC	25
o-Xylene	ND	ND	ppbV	NC	25
Styrene	ND	ND	ppbV	NC	25
Tetrachloroethene	ND	ND	ppbV	NC	25
Toluene	ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichloroethene	ND	ND	ppbV	NC	25



## Lab Duplicate Analysis Batch Quality Control

OLIN Batch Quality Contra 681076

Lab Number:

L0702947

Report Date:

03/19/07

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Volatile Organic Compounds in Air Associated sample	e(s): 01-02 QC Batch ID:	WG273473-3 QC S	ample: L0702947-0	02 Client ID:	EFFLUENT
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-trimethyl-2-pentene	ND	ND	ppbV	NC	25
2,4,4-trimethyl-1-pentene	ND	ND	ppbV	NC	25
Volatile Organic Compounds in Air Associated sample	e(s): 01-02 QC Batch ID:	WG273473-3 QC S	ample: L0702947-0	02 Client ID:	EFFLUENT
Methylene chloride	14.4	11.0	ppbV	27	25

**Project Name:** 

Project Number:

Project Name: OLIN Lab Number: L0702947

Project Number: 681076 Report Date: 03/19/07

**SAMPLE RESULTS** 

Lab ID: L0702947-02 Date Collected: 02/28/07 10:45

Client ID: EFFLUENT Date Received: 03/01/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified Matrix: Air

Anaytical Method: 43,DRAFT 1

Analytical Date: 03/14/07 20:32

Analyst: HM

### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone:

Unknown

Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%

Were all QA/QC procedures REQUIRED by the method followed?

Yes

Were all performance/acceptance standards for the required procedures achieved?

Yes
Were significant modifications made to the method as specified in Sect 11.3?

No

Parameter	Result	Qualifier	Units	RDL	Dilution Fact
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	ND		ug/m3	24.0	1
C9-C12 Aliphatics	100		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	ND		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	100		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0702947

 Project Number:
 681076
 Report Date:
 03/19/07

Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 03/14/07 12:20

Analyst: HM

Parameter	Result	Qι	ıalifier	Units	RDL
Petroleum Hydrocarbons in Air for	sample(s):	02	Batch:	WG273200-2	
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: OLIN
Project Number: 681076

Lab Number: L0702947

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associ	ated sample(s): 02 Batc	h: WG273200-1			
1,3-Butadiene	107	-	70-130	-	
Methyl tert butyl ether	112	-	70-130	-	
Benzene	121	-	70-130	-	
Toluene	105	-	70-130	-	
Ethylbenzene	114	-	70-130	-	
p/m-Xylene	119	-	70-130	-	
o-Xylene	103	-	70-130	-	
Naphthalene	102	-	70-130	-	
2-Methylnaphthalene	73	-	70-130	-	
C5-C8 Aliphatics, Adjusted	107	-	70-130	-	
C9-C12 Aliphatics, Adjusted	105	-	70-130	-	
C9-C10 Aromatics	104	-	70-130	-	



# Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

Lab Number:

L0702947

Report Date:

03/19/07

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s): 0.	2 QC Batch ID: V	VG273200-3 QC Sample:	L0703365-02	Client ID: DUP	Sample
C5-C8 Aliphatics	788	760	ug/m3	4	30
C9-C12 Aliphatics	108	87.1	ug/m3	21	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	ND	ND	ug/m3	NC	30
Toluene	81.8	77.4	ug/m3	6	30
Ethylbenzene	ND	ND	ug/m3	NC	30
p/m-Xylene	ND	ND	ug/m3	NC	30
o-Xylene	ND	ND	ug/m3	NC	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	704	679	ug/m3	4	30
C9-C12 Aliphatics, Adjusted	106	86.2	ug/m3	21	30
C9-C10 Aromatics	ND	ND	ug/m3	NC	30

**Project Name:** OLIN Lab Number: L0702947

Project Number: 681076 **Report Date:** 03/19/07

### **Sample Receipt and Container Information**

YES Were project specific reporting limits specified?

**Cooler Information** 

Cooler **Custody Seal** NA Absent

**Container Information** 

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0702947-01A	Canister - 2.7 Liter	NA	NA	NA	NA	Absent	TO-14
L0702947-02A	Canister - 2.7 Liter	NA	NA	NA	NA	Absent	APH.TO-14



Project Name:OLINLab Number:L0702947Project Number:681076Report Date:03/19/07

#### **GLOSSARY**

#### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified



Project Name: OLIN Lab Number: L0702947
Project Number: 681076 Report Date: 03/19/07

#### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



#:  Its/Report Limits    Criteria
its/Report Limits
=
:
Comments (i.e. PID)
-
clearly, legibly and Samples can not be
d turnaround time t start until any
are resolved. All omitted are subject to oment Terms. See
t t



### ANALYTICAL REPORT

Lab Number: L0704013

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: Not Specified
Project Number: Not Specified

Report Date: 04/06/07

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (200305), NJ (MA935), RI (LAO00065), ME (2006012), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.



Project Name:Not SpecifiedLab Number:L0704013Project Number:Not SpecifiedReport Date:04/06/07

Alpha Sample ID Client ID Sample Location

L0704013-01 PRE CARBON

L0704013-02 EFFLUENT



Project Name:Not SpecifiedLab Number:L0704013Project Number:Not SpecifiedReport Date:04/06/07

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

#### TO14:

The canister for sample L0704013-01 was pressurized with UHP Nitrogen due to high compound concentrations. The addition of Nitrogen resulted in a dilution of the sample. The reporting limits have been elevated accordingly.

L0704013-02 has elevated detection limits due to the 25x dilutions required by the elevated concentrations of target compounds in the sample. Re-analysis on a 109.1x dilution was required in order to quantitate sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration.

L0704013-02 and the WG275927-3 Laboratory Duplicate required re-analysis on a 2x dilution in order to quantitate sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration.

The WG275927-2 Method Blank has 1,2,3-Trichlorobenzene present. This compound is not a compound of concern for associated jobs. No further action taken.

The WG275927-3 Duplicate RPD for 2,4,4-Trimethyl-1-pentene is above criteria.

#### APH:

L0704013-02 has Acetone and 2-Butanone present in the C5-C8 Aliphatic Hydrocarbon range. The response for this analyte was not included in the calculation of the C5-C8 range result since it is not a petroleum hydrocarbon.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director

Kathle M. o'Asin

ALPHA

Date: 04/06/07

## **AIR**



**Project Name:** Lab Number: L0704013

**Project Number:** Report Date: Not Specified 04/06/07

### **SAMPLE RESULTS**

Lab ID: L0704013-01 Date Collected: 03/23/07 09:40

Client ID: PRE CARBON Date Received: 03/23/07

Field Prep: Sample Location:

Not Specified Matrix: Air

Anaytical Method: 48,TO-14A Analytical Date: 04/05/07 16:27

Analyst: Н

	ppb\	<u>/</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	12.5	ND	68.1		25
1,1,2,2-Tetrachloroethane	ND	12.5	ND	85.7		25
1,1,2-Trichloroethane	ND	12.5	ND	68.1		25
1,1-Dichloroethane	ND	12.5	ND	50.6		25
1,1-Dichloroethene	ND	12.5	ND	49.5		25
1,2,4-Trichlorbenzene	ND	12.5	ND	92.7		25
1,2,4-Trimethylbenzene	ND	12.5	ND	61.4		25
1,2-Dibromoethane	ND	12.5	ND	96.0		25
1,2-Dichlorobenzene	ND	12.5	ND	75.1		25
1,2-Dichloroethane	ND	12.5	ND	50.6		25
1,2-Dichloropropane	ND	12.5	ND	57.7		25
1,3,5-Trimethybenzene	ND	12.5	ND	61.4		25
1,3-Dichlorobenzene	ND	12.5	ND	75.1		25
1,4-Dichlorobenzene	ND	12.5	ND	75.1		25
Benzene	ND	12.5	ND	39.9		25
Benzyl chloride	ND	12.5	ND	64.7		25
Bromomethane	ND	12.5	ND	48.5		25
Carbon tetrachloride	ND	12.5	ND	78.6		25
Chlorobenzene	ND	12.5	ND	57.5		25
Chloroethane	ND	12.5	ND	33.0		25
Chloroform	ND	12.5	ND	61.0		25
Chloromethane	ND	12.5	ND	25.8		25
cis-1,2-Dichloroethene	ND	12.5	ND	49.5		25
cis-1,3-Dichloropropene	ND	12.5	ND	56.7		25
Dichlorodifluoromethane	ND	25.0	ND	124.		25



Project Name: Lab Number: L0704013

Project Number: Not Specified Report Date: 04/06/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 03/23/07 09:40

Client ID: PRE CARBON Date Received: 03/23/07
Sample Location: Field Prep: Not Specified

	ppb\	ppbV		3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	12.5	ND	54.2		25
Freon-113	ND	12.5	ND	95.7		25
Freon-114	ND	12.5	ND	87.3		25
Hexachlorobutadiene	ND	12.5	ND	133.		25
Methylene chloride	ND	25.0	ND	86.8		25
p/m-Xylene	ND	25.0	ND	108.		25
o-Xylene	ND	12.5	ND	54.2		25
Styrene	ND	12.5	ND	53.2		25
Tetrachloroethene	ND	12.5	ND	84.7		25
Toluene	ND	12.5	ND	47.1		25
trans-1,2-Dichloroethene	ND	12.5	ND	49.5		25
trans-1,3-Dichloropropene	ND	12.5	ND	56.7		25
Trichloroethene	ND	12.5	ND	67.1		25
Trichlorofluoromethane	ND	12.5	ND	70.2		25
Vinyl chloride	ND	12.5	ND	31.9		25
2,4,4-trimethyl-2-pentene	89.2	12.5	409	57.3		25
2,4,4-trimethyl-1-pentene	>20	12.5	>92	57.3		25



Not Specified

Project Name: Lab Number: L0704013

Project Number: Not Specified Report Date: 04/06/07

**SAMPLE RESULTS** 

Lab ID: L0704013-01 R Date Collected: 03/23/07 09:40

Client ID: PRE CARBON Date Received: 03/23/07

Sample Location: Field Prep:

Matrix: Air

Anaytical Method: 48,TO-14A

Analyst: H

Analytical Date:

04/06/07 09:44

	ppbV		ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
2,4,4-trimethyl-1-pentene	549	54.6	2520	250		109.1



Project Name: Lab Number: L0704013

Project Number: Not Specified Report Date: 04/06/07

**SAMPLE RESULTS** 

Lab ID: Date Collected: 03/23/07 09:45

Client ID: EFFLUENT Date Received: 03/23/07

Sample Location: Field Prep: Not Specified

Matrix: Air

Anaytical Method: 48,TO-14A

Analyst: H

04/05/07 17:08

Analytical Date:

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	1.04	0.500	4.20	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	0.580	0.500	2.34	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	>20	0.5	>53	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	4.27	0.500	8.81	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: Lab Number: L0704013

Project Number: Not Specified Report Date: 04/06/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 03/23/07 09:45

Client ID: EFFLUENT Date Received: 03/23/07
Sample Location: Field Prep: Not Specified

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	1.98	1.00	6.87	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	0.590	0.500	1.51	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	1.16	0.500	5.32	2.29		1



Not Specified

Project Name: Lab Number: L0704013

Project Number: Not Specified Report Date: 04/06/07

**SAMPLE RESULTS** 

Lab ID: L0704013-02 R Date Collected: 03/23/07 09:45

Client ID: EFFLUENT Date Received: 03/23/07

Sample Location: Field Prep:

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 04/05/07 18:21

Analyst: H

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Chloroethane	24.0	1.00	63.3	2.64		2



Project Name:Not SpecifiedLab Number:L0704013Project Number:Not SpecifiedReport Date:04/06/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 04/05/07 15:41

	ppbV		<u>ug/m3</u>			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	01-02 Batch:	WG275927-2			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



**Project Name:** Not Specified Lab Number: L0704013 Project Number: Not Specified

Report Date: 04/06/07

### **Method Blank Analysis Batch Quality Control**

Analytical Method: 48,TO-14A Analytical Date: 04/05/07 15:41

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s):	01-02 Batch:	WG275927-2			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	ND	0.500	ND	2.29		1



Project Name: Not Specified
Project Number: Not Specified

Lab Number: L0704013

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air A	associated sample(s): 01-0	2 Batch: WG275927-1			
1,1,1-Trichloroethane	89	-	70-130	-	
1,1,2,2-Tetrachloroethane	106	-	70-130	-	
1,1,2-Trichloroethane	80	-	70-130	-	
1,1-Dichloroethane	87	-	70-130	-	
1,1-Dichloroethene	84	-	70-130	-	
1,2,4-Trichlorobenzene	100	-	70-130	-	
1,2,4-Trimethylbenzene	95	-	70-130	-	
1,2-Dibromoethane	107	-	70-130	-	
1,2-Dichlorobenzene	101	-	70-130	-	
1,2-Dichloroethane	88	-	70-130	-	
1,2-Dichloropropane	84	-	70-130	-	
1,3,5-Trimethylbenzene	98	-	70-130	-	
1,3-Butadiene	80	-	70-130	-	
1,3-Dichlorobenzene	102	-	70-130	-	
1,4-Dichlorobenzene	103	-	70-130	-	
1,4-Dioxane	83	-	70-130	-	
2,2,4-Trimethylpentane	92	-	70-130	-	
2-Butanone	84	-	70-130	-	
2-Hexanone	99	-	70-130	-	
3-Chloropropene	89	-	70-130	-	
4-Ethyltoluene	92	-	70-130	-	



Project Name: Not Specified
Project Number: Not Specified

Lab Number: L0704013

	LCS	LCSD	%Recovery	DDD	DDD Limits
rameter	%Recovery	%Recovery	Limits	RPD	RPD Limits
platile Organic Compounds in Air Assoc	iated sample(s): 01-02	Batch: WG275927-1			
Acetone	101	-	70-130	-	
Benzene	92	-	70-130	-	
Benzyl chloride	104	-	70-130	-	
Bromodichloromethane	87	-	70-130	-	
Bromoform	99	-	70-130	-	
Bromomethane	86	-	70-130	-	
Carbon disulfide	87	-	70-130	-	
Carbon tetrachloride	85	-	70-130	-	
Chlorobenzene	109	-	70-130	-	
Chloroethane	85	-	70-130	-	
Chloroform	89	-	70-130	-	
Chloromethane	92	-	70-130	-	
cis-1,2-Dichloroethene	82	-	70-130	-	
cis-1,3-Dichloropropene	76	-	70-130	-	
Cyclohexane	88	-	70-130	-	
Dibromochloromethane	96	-	70-130	-	
Dichlorodifluoromethane	93	-	70-130	-	
Ethyl Alcohol	18	-	70-130	-	
Ethyl Acetate	87	-	70-130	-	
Ethylbenzene	97	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	89	-	70-130	-	

Project Name: Not Specified
Project Number: Not Specified

Lab Number: L0704013

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Ass	sociated sample(s): 01-02	Batch: WG275927-1			
1,2-Dichloro-1,1,2,2-tetrafluoroethane	89	-	70-130	-	
Hexachlorobutadiene	94	-	70-130	-	
iso-Propyl Alcohol	88	-	70-130	-	
Methylene chloride	97	-	70-130	-	
4-Methyl-2-pentanone	77	-	70-130	-	
Methyl tert butyl ether	80	-	70-130	-	
p/m-Xylene	104	-	70-130	-	
o-Xylene	102	-	70-130	-	
n-Hexane	80	-	70-130	-	
Propylene	92	-	70-130	-	
Styrene	93	-	70-130	-	
Tetrachloroethene	108	-	70-130	-	
Tetrahydrofuran	89	-	70-130	-	
Toluene	103	-	70-130	-	
trans-1,2-Dichloroethene	85	-	70-130	-	
trans-1,3-Dichloropropene	85	-	70-130	-	
Trichloroethene	84	-	70-130	-	
Trichlorofluoromethane	100	-	70-130	-	
Vinyl acetate	80	-	70-130	-	
Vinyl bromide	100	-	70-130	-	
Vinyl chloride	92	-	70-130	-	



Project Name: Not Specified
Project Number: Not Specified

Lab Number:

L0704013

Report Date:

04/06/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Associa	ated sample(s): 01-02	Batch: WG275927-1			
1,2,3-Trichloropropane	109	-	70-130	-	
Naphthalene	62	-	70-130	-	
1,2,3-Trichlorobenzene	97	-	70-130	-	

Project Name: Not Specified
Project Number: Not Specified

**Lab Number:** L0704013

arameter	Native Sample	Duplicate Sar	mple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG275927-3	QC Sample: L0704013-0	2 Client ID:	EFFLUENT
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	1.04	1.12	ppbV	7	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorbenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	0.580	0.610	ppbV	5	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
Benzene	ND	ND	ppbV	NC	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25



Project Name: Not Specified
Project Number: Not Specified

Lab Number: L0704013

arameter	Native Sample	Duplicate Sam	ple Units	RPD	RPD Limits
platile Organic Compounds in Air Associated	sample(s): 01-02 QC Batch ID	: WG275927-3 Q	C Sample: L0704013	-02 Client ID:	EFFLUENT
Chloroethane	>20	>20	ppbV	NC	25
Chloroform	ND	ND	ppbV	NC	25
Chloromethane	4.27	4.99	ppbV	16	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Dichlorodifluoromethane	ND	1.15	ppbV	NC	25
Ethylbenzene	ND	ND	ppbV	NC	25
Freon-113	ND	ND	ppbV	NC	25
Freon-114	ND	ND	ppbV	NC	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25
Methylene chloride	1.98	2.15	ppbV	8	25
p/m-Xylene	ND	ND	ppbV	NC	25
o-Xylene	ND	ND	ppbV	NC	25
Styrene	ND	ND	ppbV	NC	25
Tetrachloroethene	ND	ND	ppbV	NC	25
Toluene	ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichloroethene	ND	ND	ppbV	NC	25



Project Name: Not Specified
Project Number: Not Specified

pality Control Lab Number:

Report Date:

L0704013 04/06/07

Parameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits
Volatile Organic Compounds in Air Ass	sociated sample(s): 01-02 QC Ba	tch ID: WG275927-3	QC Sample: L0704013	3-02 Client ID:	EFFLUENT
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	0.590	0.670	ppbV	13	25
2,4,4-trimethyl-2-pentene	ND	ND	ppbV	NC	25
2,4,4-trimethyl-1-pentene	1.16	2.32	ppbV	67	25
Volatile Organic Compounds in Air Ass	sociated sample(s): 01-02 QC Ba	tch ID: WG275927-3	QC Sample: L0704013	3-02 Client ID:	EFFLUENT
Chloroethane	24.0	26.4	ppbV	8	25

Project Name: Not Specified Lab Number: L0704013

Project Number: Not Specified Report Date: 04/06/07

**SAMPLE RESULTS** 

Lab ID: L0704013-02 Date Collected: 03/23/07 09:45

Client ID: EFFLUENT Date Received: 03/23/07
Sample Location: Not Specified Field Prep: Not Specified

Matrix: Air

Analytical Method: 43,DRAFT 1 Analytical Date: 04/03/07 17:35

Analyst: HM

### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone:

Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Were all QA/QC procedures REQUIRED by the method followed?

Yes

Were all performance/acceptance standards for the required procedures achieved?

Yes

Were significant modifications made to the method as specified in Sect 11.3?

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	180		ug/m3	24.0	1
C9-C12 Aliphatics	205		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	179		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	205		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



Project Name:Not SpecifiedLab Number:L0704013Project Number:Not SpecifiedReport Date:04/06/07

Method Blank Analysis
Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 04/03/07 15:15

Analyst: HM

Parameter	Result	Qι	ıalifier	Units	RDL
Petroleum Hydrocarbons in Air for	sample(s):	02	Batch:	WG275443-2	
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: Not Specified
Project Number: Not Specified

Lab Number: L0704013

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated s	sample(s): 02 Bat	ch: WG275443-1			
1,3-Butadiene	107	-	70-130	-	
Methyl tert butyl ether	112	-	70-130	-	
Benzene	121	-	70-130	-	
Toluene	105	-	70-130	-	
Ethylbenzene	114	-	70-130	-	
p/m-Xylene	119	-	70-130	-	
o-Xylene	103	-	70-130	-	
Naphthalene	102	-	70-130	-	
2-Methylnaphthalene	73	-	70-130	-	
C5-C8 Aliphatics, Adjusted	107	-	70-130	-	
C9-C12 Aliphatics, Adjusted	105	-	70-130	-	
C9-C10 Aromatics	104	-	70-130	-	



**Project Name:** Not Specified **Project Number:** Not Specified

Lab Number: L0704013

04/06/07 Report Date:

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s	s): 02 QC Batch ID: WG2	275443-3 QC Sample: I	_0704389-02 C	Client ID: DUP Sa	ample
C5-C8 Aliphatics	360	389	ug/m3	8	30
C9-C12 Aliphatics	424	506	ug/m3	18	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	ND	ND	ug/m3	NC	30
Toluene	47.2	47.7	ug/m3	1	30
Ethylbenzene	18.4	19.7	ug/m3	7	30
p/m-Xylene	71.3	84.4	ug/m3	17	30
o-Xylene	24.1	29.3	ug/m3	19	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	9.55	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	199	208	ug/m3	4	30
C9-C12 Aliphatics, Adjusted	266	322	ug/m3	19	30
C9-C10 Aromatics	158	184	ug/m3	15	30

Project Name:Not SpecifiedLab Number:L0704013Project Number:Not SpecifiedReport Date:04/06/07

### **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Cooler Information** 

**Cooler Custody Seal** N/A Absent

#### **Container Information**

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0704013-01A	Canister - 2.7 Liter	N/A	NA	NA	NA	Absent	TO-14
L0704013-02A	Canister - 2.7 Liter	N/A	NA	NA	NA	Absent	APH,TO-14



Project Name:Not SpecifiedLab Number:L0704013Project Number:Not SpecifiedReport Date:04/06/07

#### **GLOSSARY**

#### Acronyms

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
  - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Data Usability Report



Project Name:Not SpecifiedLab Number:L0704013Project Number:Not SpecifiedReport Date:04/06/07

#### REFERENCES

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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Eight Walkup Drive	CHAIN OF CUSTODY Westborough, MA 01581	Project Info	rmation			Report	Informat	ion - Data	Delive	erable			ig Info			
	FAX: 508-898-9193	Project Name:				☐ FAX					_	□ Sam	ne as Cl	lient in	nfo PO#:	
Client Information		Project Location	on:			D ADE	x riteria Che	cker:			_					
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Stoughton	~ MA 02072	ALPHA Quote	#:			☐ Add	itional Deli	verables:			_	State/	Fed	P	Program	Criteria
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#### ANALYTICAL REPORT

Lab Number: L0705653

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 05/08/07



 Project Name:
 OLIN
 Lab Number:
 L0705653

 Project Number:
 681076
 Report Date:
 05/08/07

Alpha Sample IDClient IDSample LocationL0705653-01PRE CARBONWILMINGTON, MAL0705653-02EFFLUENTWILMINGTON, MA

 Project Name:
 OLIN
 Lab Number:
 L0705653

 Project Number:
 681076
 Report Date:
 05/08/07

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

TO-14

L0705653-01 has elevated detection limits due to the dilutions required by the elevated concentrations of target compounds in the sample.

**APH** 

L0705653-02 has Acetone, 2-butanone and a Silane Isomer present in the C5-C8 Aliphatic Hydrocarbon range. The response for this analyte was not included in the calculation of the C5-C8 range result since it is not petroleum a hydrocarbon.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director Date: 05/08/07



### **AIR**



**Project Name:** Lab Number: OLIN L0705653 **Project Number:** 681076 **Report Date:** 

05/08/07

#### **SAMPLE RESULTS**

Lab ID: L0705653-01 Date Collected: 04/19/07 14:10 Client ID: PRE CARBON Date Received: 04/20/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix:

48,TO-14A Anaytical Method: Analytical Date: 05/07/07 17:16

Analyst: НМ

	ppbV	<u>'</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	5.00	ND	27.2		10
1,1,2,2-Tetrachloroethane	ND	5.00	ND	34.3		10
1,1,2-Trichloroethane	ND	5.00	ND	27.2		10
1,1-Dichloroethane	ND	5.00	ND	20.2		10
1,1-Dichloroethene	ND	5.00	ND	19.8		10
1,2,4-Trichlorbenzene	ND	5.00	ND	37.1		10
1,2,4-Trimethylbenzene	ND	5.00	ND	24.6		10
1,2-Dibromoethane	ND	5.00	ND	38.4		10
1,2-Dichlorobenzene	ND	5.00	ND	30.0		10
1,2-Dichloroethane	ND	5.00	ND	20.2		10
1,2-Dichloropropane	ND	5.00	ND	23.1		10
1,3,5-Trimethybenzene	ND	5.00	ND	24.6		10
1,3-Dichlorobenzene	ND	5.00	ND	30.0		10
1,4-Dichlorobenzene	ND	5.00	ND	30.0		10
Benzene	ND	5.00	ND	16.0		10
Benzyl chloride	ND	5.00	ND	25.9		10
Bromomethane	ND	5.00	ND	19.4		10
Carbon tetrachloride	ND	5.00	ND	31.4		10
Chlorobenzene	ND	5.00	ND	23.0		10
Chloroethane	ND	5.00	ND	13.2		10
Chloroform	ND	5.00	ND	24.4		10
Chloromethane	ND	5.00	ND	10.3		10
cis-1,2-Dichloroethene	ND	5.00	ND	19.8		10
cis-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Dichlorodifluoromethane	ND	10.0	ND	49.4		10



**Project Name:** Lab Number: OLIN L0705653 **Project Number:** 681076

**Report Date:** 05/08/07

#### **SAMPLE RESULTS**

Lab ID: Date Collected: L0705653-01 04/19/07 14:10 Client ID: PRE CARBON Date Received: 04/20/07 Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppb\	<u> </u>	ug/m	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	5.00	ND	21.7		10
Freon-113	ND	5.00	ND	38.3		10
Freon-114	ND	5.00	ND	34.9		10
Hexachlorobutadiene	ND	5.00	ND	53.3		10
Methylene chloride	ND	10.0	ND	34.7		10
p/m-Xylene	ND	10.0	ND	43.4		10
o-Xylene	ND	5.00	ND	21.7		10
Styrene	ND	5.00	ND	21.3		10
Tetrachloroethene	ND	5.00	ND	33.9		10
Toluene	ND	5.00	ND	18.8		10
trans-1,2-Dichloroethene	ND	5.00	ND	19.8		10
trans-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Trichloroethene	ND	5.00	ND	26.8		10
Trichlorofluoromethane	ND	5.00	ND	28.1		10
Vinyl chloride	ND	5.00	ND	12.8		10
2,4,4-trimethyl-2-pentene	11.8	5.00	54.1	22.9		10
2,4,4-trimethyl-1-pentene	95.3	5.00	437	22.9		10



**Project Name:** Lab Number: OLIN L0705653 **Project Number:** 681076

**Report Date:** 05/08/07

#### **SAMPLE RESULTS**

Date Collected: Lab ID: L0705653-02 04/19/07 14:15

Client ID: **EFFLUENT** Date Received: 04/20/07 Sample Location: Field Prep: Not Specified WILMINGTON, MA

Matrix:

48,TO-14A Anaytical Method: Analytical Date: 05/07/07 17:49

Analyst: НМ

	ppbV	<u>'</u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	0.619	0.500	3.04	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	3.81	0.500	10.0	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0705653

Project Number: 681076 Report Date: 05/08/07

#### **SAMPLE RESULTS**

 Lab ID:
 L0705653-02
 Date Collected:
 04/19/07 14:15

 Client ID:
 EFFLUENT
 Date Received:
 04/20/07

Client ID: EFFLUENT Date Received: 04/20/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppb\	<u></u>	ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	ND	0.500	ND	2.29		1



Project Name:OLINLab Number:L0705653Project Number:681076Report Date:05/08/07

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A

05/07/07 15:22

Analytical Date:

	ppb\	<u>/</u>	ug/m3			Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor	
Volatile Organic Compounds in Air for s	sample(s):	01-02 Batch:	WG279508-2				
1,1,1-Trichloroethane	ND	0.521	ND	2.84		1.042	
1,1,2,2-Tetrachloroethane	ND	0.521	ND	3.57		1.042	
1,1,2-Trichloroethane	ND	0.521	ND	2.84		1.042	
1,1-Dichloroethane	ND	0.521	ND	2.11		1.042	
1,1-Dichloroethene	ND	0.521	ND	2.06		1.042	
1,2,4-Trichlorbenzene	ND	0.521	ND	3.86		1.042	
1,2,4-Trimethylbenzene	ND	0.521	ND	2.56		1.042	
1,2-Dibromoethane	ND	0.521	ND	4.00		1.042	
1,2-Dichlorobenzene	ND	0.521	ND	3.13		1.042	
1,2-Dichloroethane	ND	0.521	ND	2.11		1.042	
1,2-Dichloropropane	ND	0.521	ND	2.40		1.042	
1,3,5-Trimethybenzene	ND	0.521	ND	2.56		1.042	
1,3-Dichlorobenzene	ND	0.521	ND	3.13		1.042	
1,4-Dichlorobenzene	ND	0.521	ND	3.13		1.042	
Benzene	ND	0.521	ND	1.66		1.042	
Benzyl chloride	ND	0.521	ND	2.70		1.042	
Bromomethane	ND	0.521	ND	2.02		1.042	
Carbon tetrachloride	ND	0.521	ND	3.28		1.042	
Chlorobenzene	ND	0.521	ND	2.40		1.042	
Chloroethane	ND	0.521	ND	1.37		1.042	
Chloroform	ND	0.521	ND	2.54		1.042	
Chloromethane	ND	0.521	ND	1.08		1.042	
cis-1,2-Dichloroethene	ND	0.521	ND	2.06		1.042	
cis-1,3-Dichloropropene	ND	0.521	ND	2.36		1.042	
Dichlorodifluoromethane	ND	1.04	ND	5.15		1.042	



**Project Name:** OLIN Lab Number: L0705653

Project Number: 681076 Report Date: 05/08/07

# Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 05/07/07 15:22

	ppb	<u>v</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	sample(s):	01-02 Batch:	WG279508-2			
Ethylbenzene	ND	0.521	ND	2.26		1.042
Freon-113	ND	0.521	ND	3.99		1.042
Freon-114	ND	0.521	ND	3.64		1.042
Hexachlorobutadiene	ND	0.521	ND	5.55		1.042
Methylene chloride	ND	1.04	ND	3.62		1.042
p/m-Xylene	ND	1.04	ND	4.52		1.042
o-Xylene	ND	0.521	ND	2.26		1.042
Styrene	ND	0.521	ND	2.22		1.042
Tetrachloroethene	ND	0.521	ND	3.53		1.042
Toluene	ND	0.521	ND	1.96		1.042
trans-1,2-Dichloroethene	ND	0.521	ND	2.06		1.042
trans-1,3-Dichloropropene	ND	0.521	ND	2.36		1.042
Trichloroethene	ND	0.521	ND	2.80		1.042
Trichlorofluoromethane	ND	0.521	ND	2.92		1.042
Vinyl chloride	ND	0.521	ND	1.33		1.042
2,4,4-trimethyl-2-pentene	ND	0.521	ND	2.39		1.042
2,4,4-trimethyl-1-pentene	ND	0.521	ND	2.39		1.042



Project Name: OLIN
Project Number: 681076

Lab Number: L0705653

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air A	associated sample(s): 01-02	Batch: WG279508-1			
1,1,1-Trichloroethane	104	-	70-130	-	
1,1,2,2-Tetrachloroethane	92	-	70-130	-	
1,1,2-Trichloroethane	102	-	70-130	-	
1,1-Dichloroethane	99	-	70-130	-	
1,1-Dichloroethene	98	-	70-130	-	
1,2,4-Trichlorobenzene	97	-	70-130	-	
1,2,4-Trimethylbenzene	90	-	70-130	-	
1,2-Dibromoethane	92	-	70-130	-	
1,2-Dichlorobenzene	99	-	70-130	-	
1,2-Dichloroethane	114	-	70-130	-	
1,2-Dichloropropane	97	-	70-130	-	
1,3,5-Trimethylbenzene	90	-	70-130	-	
1,3-Butadiene	108	-	70-130	-	
1,3-Dichlorobenzene	102	-	70-130	-	
1,4-Dichlorobenzene	100	-	70-130	-	
1,4-Dioxane	112	-	70-130	-	
2,2,4-Trimethylpentane	104	-	70-130	-	
2-Butanone	96	-	70-130	-	
2-Hexanone	77	-	70-130	-	
3-Chloropropene	127	-	70-130	-	
4-Ethyltoluene	91	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number: L0705653

rameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
platile Organic Compounds in Air	Associated sample(s): 01-0	D2 Batch: WG279508-1			
Acetone	112	-	70-130	-	
Benzene	92	-	70-130	-	
Benzyl chloride	109	-	70-130	-	
Bromodichloromethane	106	-	70-130	-	
Bromoform	96	-	70-130	-	
Bromomethane	84	-	70-130	-	
Carbon disulfide	95	-	70-130	-	
Carbon tetrachloride	108	-	70-130	-	
Chlorobenzene	89	-	70-130	-	
Chloroethane	94	-	70-130	-	
Chloroform	103	-	70-130	-	
Chloromethane	96	-	70-130	-	
cis-1,2-Dichloroethene	109	-	70-130	-	
cis-1,3-Dichloropropene	106	-	70-130	-	
Cyclohexane	94	-	70-130	-	
Dibromochloromethane	95	-	70-130	-	
Dichlorodifluoromethane	100	-	70-130	-	
Ethyl Alcohol	93	-	70-130	-	
Ethyl Acetate	106	-	70-130	-	
Ethylbenzene	96	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	94	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0705653

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
/olatile Organic Compounds in Air Associate	ed sample(s): 01-02	Batch: WG279508-1			
1,2-Dichloro-1,1,2,2-tetrafluoroethane	93	-	70-130	-	
Hexachlorobutadiene	99	-	70-130	-	
iso-Propyl Alcohol	104	-	70-130	-	
Methylene chloride	100	-	70-130	-	
4-Methyl-2-pentanone	99	-	70-130	-	
Methyl tert butyl ether	109	-	70-130	-	
p/m-Xylene	94	-	70-130	-	
o-Xylene	97	-	70-130	-	
n-Hexane	94	-	70-130	-	
Propylene	96	-	70-130	-	
Styrene	98	-	70-130	-	
Tetrachloroethene	88	-	70-130	-	
Tetrahydrofuran	108	-	70-130	-	
Toluene	85	-	70-130	-	
trans-1,2-Dichloroethene	116	-	70-130	-	
trans-1,3-Dichloropropene	102	-	70-130	-	
Trichloroethene	97	-	70-130	-	
Trichlorofluoromethane	103	-	70-130	-	
Vinyl acetate	71	-	70-130	-	
Vinyl bromide	100	-	70-130	-	
Vinyl chloride	99	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number:

L0705653

Report Date:

05/08/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Ass	ociated sample(s): 01-02	Batch: WG279508-1			
2,4,4-Trimethyl-2-Pentene	112	-	70-130	-	
2,4,4-Trimethyl-1-Pentene	108	-	70-130	-	
1,2,3-Trichloropropane	93	-	70-130	-	
Naphthalene	95	-	70-130	-	
1,2,3-Trichlorobenzene	76	-	70-130	-	



L0705653

# Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

ntrol Lab Number:

Parameter	Native Sample	Duplicate Sar	mple Units	RPD	RPD Limits
/olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG279508-3	QC Sample: L0705653-0	2 Client ID:	: EFFLUENT
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorbenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	0.619	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	ND	ND	ppbV	NC	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
Benzene	ND	ND	ppbV	NC	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25



**Project Name:** OLIN **Project Number:** 681076

Lab Number:

Report Date:

L0705653 05/08/07

rameter		Native	Sample	Duplicate Sa	ample Units	RPD	RPD Limits
olatile Organic Compounds in Air	Associated sample(s):	01-02	QC Batch ID:	WG279508-3	QC Sample: L0705653	3-02 Client ID:	EFFLUENT
Chloroethane		3.	81	3.54	ppbV	7	25
Chloroform		N	D	ND	ppbV	NC	25
Chloromethane		N	D	ND	ppbV	NC	25
cis-1,2-Dichloroethene		N	D	ND	ppbV	NC	25
cis-1,3-Dichloropropene		N	D	ND	ppbV	NC	25
Dichlorodifluoromethane		N	D	ND	ppbV	NC	25
Ethylbenzene		N	D	ND	ppbV	NC	25
Freon-113		N	D	ND	ppbV	NC	25
Freon-114		N	D	ND	ppbV	NC	25
Hexachlorobutadiene		N	D	ND	ppbV	NC	25
Methylene chloride		N	D	ND	ppbV	NC	25
p/m-Xylene		N	D	ND	ppbV	NC	25
o-Xylene		N	D	ND	ppbV	NC	25
Styrene		N	D	ND	ppbV	NC	25
Tetrachloroethene		N	D	ND	ppbV	NC	25
Toluene		N	D	ND	ppbV	NC	25
trans-1,2-Dichloroethene		N	D	ND	ppbV	NC	25
trans-1,3-Dichloropropene		N	D	ND	ppbV	NC	25
Trichloroethene		N	D	ND	ppbV	NC	25



Project Name: OLIN Batch Quality Con
Project Number: 681076

Lab Number:

L0705653

Report Date:

05/08/07

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Volatile Organic Compounds in Air	Associated sample(s): 01-02 QC Batch ID	D: WG279508-3 QC S	Sample: L0705653-0	2 Client ID:	EFFLUENT
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-trimethyl-2-pentene	ND	ND	ppbV	NC	25
2,4,4-trimethyl-1-pentene	ND	ND	ppbV	NC	25

Project Name: OLIN Lab Number: L0705653

Project Number: 681076 Report Date: 05/08/07

**SAMPLE RESULTS** 

Lab ID: L0705653-02 Date Collected: 04/19/07 14:15

Client ID: EFFLUENT Date Received: 04/20/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 43,DRAFT 1 Analytical Date: 05/02/07 20:53

Analyst: HM

#### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone: Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%

Were all QA/QC procedures REQUIRED by the method followed?

Were all performance/acceptance standards for the required procedures achieved?

Yes

Were significant modifications made to the method as specified in Sect 11.3?

Parameter	Result	Qualifier	Units	RDL	Dilution Facto
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	121		ug/m3	24.0	1
C9-C12 Aliphatics	361		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	121		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	360		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0705653

 Project Number:
 681076
 Report Date:
 05/08/07

Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 05/02/07 12:07

Analyst: HM

Parameter	Result	Qι	ıalifier	Units	RDL
Petroleum Hydrocarbons in Air for	sample(s):	02	Batch:	WG279003-2	
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: OLIN
Project Number: 681076

Lab Number: L0705653

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associ	ated sample(s): 02 Batc	h: WG279003-1			
1,3-Butadiene	107	-	70-130	-	
Methyl tert butyl ether	112	-	70-130	-	
Benzene	121	-	70-130	-	
Toluene	105	-	70-130	-	
Ethylbenzene	114	-	70-130	-	
p/m-Xylene	119	-	70-130	-	
o-Xylene	103	-	70-130	-	
Naphthalene	102	-	70-130	-	
2-Methylnaphthalene	73	-	70-130	-	
C5-C8 Aliphatics, Adjusted	107	-	70-130	-	
C9-C12 Aliphatics, Adjusted	105	-	70-130	-	
C9-C10 Aromatics	104	-	70-130	-	



L0705653

# Lab Duplicate Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

Quality Control Lab Number:

**Report Date:** 05/08/07

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s): 02	QC Batch ID: Wo	G279003-3 QC Sample:	L0705795-01	Client ID: DUP \$	Sample
C5-C8 Aliphatics	13200	14400	ug/m3	9	30
C9-C12 Aliphatics	457	598	ug/m3	27	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	29.2	47.1	ug/m3	47	30
Toluene	3580	4050	ug/m3	12	30
Ethylbenzene	808	855	ug/m3	6	30
p/m-Xylene	2030	2260	ug/m3	11	30
o-Xylene	515	556	ug/m3	8	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	6290	6680	ug/m3	6	30
C9-C12 Aliphatics, Adjusted	457	598	ug/m3	29	30
C9-C10 Aromatics	ND	ND	ug/m3	NC	30

Project Name: OLIN Lab Number: L0705653

Project Number: 681076 Report Date: 05/08/07

### **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Cooler Information** 

**Cooler Custody Seal** N/A Absent

### **Container Information**

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0705653-01A	Canister - 2.7 Liter	N/A	NA	NA	NA	Absent	TO-14
L0705653-02A	Canister - 2.7 Liter	N/A	NA	NA	NA	Absent	APH,TO-14



Project Name:OLINLab Number:L0705653Project Number:681076Report Date:05/08/07

#### **GLOSSARY**

### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified

ALPHA WOODS HOLE LABS Project Name: OLIN Lab Number: L0705653

Project Number: 681076 Report Date: 05/08/07

#### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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### ANALYTICAL REPORT

Lab Number: L0707334

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 861076
Report Date: 06/11/07

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (200305), NJ (MA935), RI (LAO00065), ME (2006012), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.



Project Name:OLINLab Number:L0707334Project Number:861076Report Date:06/11/07

Alpha Sample IDClient IDSample LocationL0707334-01PRE CARBONWILMINGTON, MAL0707334-02EFFLUENTWILMINGTON, MA

Project Name:OLINLab Number:L0707334Project Number:861076Report Date:06/11/07

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

### TO14

L0707334-01 was re-analyzed due to an over dilution on original analysis. The results of the re-analysis is reported.

L0707334-02 required re-analysis on dilution in order to quantitate the sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration.

#### APH

L0707334-02 has Acetone, and Methylene Chloride present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director/Representative

ALPHA WOODS HOLE LABS

Date: 06/11/07

### **AIR**



Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

### **SAMPLE RESULTS**

Lab ID: L0707334-01 R Date Collected: 05/17/07 14:15

Client ID: PRE CARBON Date Received: 05/21/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 06/08/07 16:32

Analyst: HM

	ppbV	<u>'</u>	ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	1.58	0.500	4.16	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

### **SAMPLE RESULTS**

Lab ID: L0707334-01 R Date Collected: 05/17/07 14:15

Client ID: PRE CARBON Date Received: 05/21/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

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Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 05/17/07 14:30

Client ID: EFFLUENT Date Received: 05/21/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 06/08/07 15:00

Analyst: HM

	ppbV	<u>'</u>	ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	0.628	0.500	3.06	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	1.37	1.00	6.76	4.94		1



Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 05/17/07 14:30

Client ID: EFFLUENT Date Received: 05/21/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

·						•
	ppb\	<u>/</u>	ug/m3	<u> </u>		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	3.97	1.00	13.8	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	4.02	0.500	18.4	2.29		1
2,4,4-trimethyl-1-pentene	>20	0.5	>92	2.29		1
2,4,4-trimethyl-2-pentene	4.02	0.500	18.4	2.29		1



Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

**SAMPLE RESULTS** 

Lab ID: L0707334-02 R Date Collected: 05/17/07 14:30

Client ID: EFFLUENT Date Received: 05/21/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 06/08/07 16:00

Analyst: HM

	ppb\	<u>/</u>	<u>ug/m3</u>			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
2,4,4-trimethyl-1-pentene	45.2	2.50	207	11.5		5



Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 06/08/07 09:56

	ppb	oV	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	01-02 Batch:	WG282495-5			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 06/08/07 09:56

	ppb	v	ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s):	01-02 Batch:	WG282495-5			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1



**Project Name:** OLIN

**Project Number:** 861076

Lab Number: L0707334

Report Date: 06/11/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Associate	ed sample(s): 01-02	2 Batch: WG282495-4			
1,1,1-Trichloroethane	106	-	70-130	-	
1,1,2,2-Tetrachloroethane	114	-	70-130	-	
1,1,2-Trichloroethane	110	-	70-130	-	
1,1-Dichloroethane	111	-	70-130	-	
1,1-Dichloroethene	106	-	70-130	-	
1,2,4-Trichlorobenzene	104	-	70-130	-	
1,2,4-Trimethylbenzene	116	-	70-130	-	
1,2-Dibromoethane	108	-	70-130	-	
1,2-Dichlorobenzene	112	-	70-130	-	
1,2-Dichloroethane	107	-	70-130	-	
1,2-Dichloropropane	113	-	70-130	-	
1,3,5-Trimethylbenzene	122	-	70-130	-	
1,3-Butadiene	103	-	70-130	-	
1,3-Dichlorobenzene	112	-	70-130	-	
1,4-Dichlorobenzene	115	-	70-130	-	
2,2,4-Trimethylpentane	105	-	70-130	-	
2-Butanone	116	-	70-130	-	
2-Hexanone	118	-	70-130	-	
3-Chloropropene	109	-	70-130	-	
4-Ethyltoluene	127	-	70-130	-	
Acetone	118	-	70-130	-	

Project Name: OLIN
Project Number: 861076

Lab Number: L0707334

**Report Date:** 06/11/07

rameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
platile Organic Compounds in Air	Associated sample(s): 01-0	2 Batch: WG282495-4			
Benzene	110	-	70-130	-	
Benzyl chloride	127	-	70-130	-	
Bromodichloromethane	105	-	70-130	-	
Bromoform	117	-	70-130	-	
Bromomethane	102	•	70-130	-	
Carbon disulfide	101	-	70-130	-	
Carbon tetrachloride	104	-	70-130	-	
Chlorobenzene	109	-	70-130	-	
Chloroethane	109	-	70-130	-	
Chloroform	103	-	70-130	-	
Chloromethane	103	-	70-130	-	
cis-1,2-Dichloroethene	104	-	70-130	-	
cis-1,3-Dichloropropene	110	-	70-130	-	
Cyclohexane	103	-	70-130	-	
Dibromochloromethane	111	-	70-130	-	
Dichlorodifluoromethane	115	-	70-130	-	
Ethyl Alcohol	99	-	70-130	-	
Ethyl Acetate	108	-	70-130	-	
Ethylbenzene	119	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	110	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	110	-	70-130	-	



Project Name: OLIN
Project Number: 861076

Lab Number: L0707334

**Report Date:** 06/11/07

Volatile Organic Compounds in Air Associated sample(s):         01-02         Batch:         WG2824           Hexachlorobutadiene         90         -           iso-Propyl Alcohol         102         -           Methylene chloride         102         -           4-Methyl-2-pentanone         114         -           Methyl tert butyl ether         125         -           p/m-Xylene         119         -           o-Xylene         112         -           n-Hexane         103         -           Propylene         111         -           Styrene         116         -           Tetrachloroethene         102         -           Tetrahydrofuran         126         -           Toluene         114         -           trans-1,2-Dichloroethene         105         -           trans-1,3-Dichloropropene         112         -           Trichlorofluoromethane         101         -	70-130 70-130 70-130 70-130 70-130 70-130 70-130 70-130 70-130	- - - - - -	
iso-Propyl Alcohol       102       -         Methylene chloride       102       -         4-Methyl-2-pentanone       114       -         Methyl tert butyl ether       125       -         p/m-Xylene       119       -         o-Xylene       112       -         n-Hexane       103       -         Propylene       111       -         Styrene       116       -         Tetrachloroethene       102       -         Tetrahydrofuran       126       -         Toluene       114       -         trans-1,2-Dichloroethene       105       -         trans-1,3-Dichloropropene       112       -         Trichloroethene       102       -	70-130 70-130 70-130 70-130 70-130 70-130	- - - - -	
Methylene chloride       102       -         4-Methyl-2-pentanone       114       -         Methyl tert butyl ether       125       -         p/m-Xylene       119       -         o-Xylene       112       -         n-Hexane       103       -         Propylene       111       -         Styrene       116       -         Tetrachloroethene       102       -         Tetrahydrofuran       126       -         Toluene       114       -         trans-1,2-Dichloroethene       105       -         trans-1,3-Dichloropropene       112       -         Trichloroethene       102       -	70-130 70-130 70-130 70-130 70-130	- - -	
4-Methyl-2-pentanone       114       -         Methyl tert butyl ether       125       -         p/m-Xylene       119       -         o-Xylene       112       -         n-Hexane       103       -         Propylene       111       -         Styrene       116       -         Tetrachloroethene       102       -         Toluene       114       -         trans-1,2-Dichloroethene       105       -         trans-1,3-Dichloropropene       112       -         Trichloroethene       102       -	70-130 70-130 70-130 70-130	- - -	
Methyl tert butyl ether       125       -         p/m-Xylene       119       -         o-Xylene       112       -         n-Hexane       103       -         Propylene       111       -         Styrene       116       -         Tetrachloroethene       102       -         Tetrahydrofuran       126       -         Toluene       114       -         trans-1,2-Dichloroethene       105       -         trans-1,3-Dichloropropene       112       -         Trichloroethene       102       -	70-130 70-130 70-130	- - -	
p/m-Xylene       119       -         o-Xylene       112       -         n-Hexane       103       -         Propylene       111       -         Styrene       116       -         Tetrachloroethene       102       -         Tetrahydrofuran       126       -         Toluene       114       -         trans-1,2-Dichloroethene       105       -         trans-1,3-Dichloropropene       112       -         Trichloroethene       102       -	70-130 70-130	-	
o-Xylene       112       -         n-Hexane       103       -         Propylene       111       -         Styrene       116       -         Tetrachloroethene       102       -         Tetrahydrofuran       126       -         Toluene       114       -         trans-1,2-Dichloroethene       105       -         trans-1,3-Dichloropropene       112       -         Trichloroethene       102       -	70-130	-	
n-Hexane         103         -           Propylene         111         -           Styrene         116         -           Tetrachloroethene         102         -           Tetrahydrofuran         126         -           Toluene         114         -           trans-1,2-Dichloroethene         105         -           trans-1,3-Dichloropropene         112         -           Trichloroethene         102         -			
Propylene         111         -           Styrene         116         -           Tetrachloroethene         102         -           Tetrahydrofuran         126         -           Toluene         114         -           trans-1,2-Dichloroethene         105         -           trans-1,3-Dichloropropene         112         -           Trichloroethene         102         -	70-130	-	
Styrene         116         -           Tetrachloroethene         102         -           Tetrahydrofuran         126         -           Toluene         114         -           trans-1,2-Dichloroethene         105         -           trans-1,3-Dichloropropene         112         -           Trichloroethene         102         -			
Tetrachloroethene         102         -           Tetrahydrofuran         126         -           Toluene         114         -           trans-1,2-Dichloroethene         105         -           trans-1,3-Dichloropropene         112         -           Trichloroethene         102         -	70-130	-	
Tetrahydrofuran         126         -           Toluene         114         -           trans-1,2-Dichloroethene         105         -           trans-1,3-Dichloropropene         112         -           Trichloroethene         102         -	70-130	-	
Toluene         114         -           trans-1,2-Dichloroethene         105         -           trans-1,3-Dichloropropene         112         -           Trichloroethene         102         -	70-130	-	
trans-1,2-Dichloroethene 105 - trans-1,3-Dichloropropene 112 - Trichloroethene 102 -	70-130	-	
trans-1,3-Dichloropropene 112 - Trichloroethene 102 -	70-130	-	
Trichloroethene 102 -	70-130	-	
	70-130	-	
Trichlorofluoromethane 101 -	70-130	-	
	70-130	-	
Vinyl acetate 101 -	70-130	_	
Vinyl bromide 101 -		<del>-</del>	
Vinyl chloride 109 -	70-130	-	
1,2,3-Trichloropropane 120 -	70-130 70-130		

**Project Name:** OLIN **Project Number:** 861076

Lab Number: L0707334

Report Date:

06/11/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Asso	ciated sample(s): 01-02	Batch: WG282495-4			
Naphthalene	110	-	70-130	-	
1,2,3-Trichlorobenzene	115	-	70-130	-	

**Project Name:** OLIN **Project Number:** 861076

**Lab Number:** L0707334

**Report Date:** 06/11/07

arameter	Native Sample	Duplicate Sar	nple Units	RPD	RPD Limits	
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID	: WG282495-3	QC Sample: L0707343-0	1 Client ID:	DUP Sample	
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25	
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25	
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25	
1,1-Dichloroethane	ND	ND	ppbV	NC	25	
1,1-Dichloroethene	ND	ND	ppbV	NC	25	
1,2,4-Trichlorbenzene	ND	ND	ppbV	NC	25	
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25	
1,2-Dibromoethane	ND	ND	ppbV	NC	25	
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25	
1,2-Dichloroethane	ND	ND	ppbV	NC	25	
1,2-Dichloropropane	ND	ND	ppbV	NC	25	
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25	
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25	
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25	
Benzene	ND	ND	ppbV	NC	25	
Benzyl chloride	ND	ND	ppbV	NC	25	
Bromomethane	ND	ND	ppbV	NC	25	
Carbon tetrachloride	ND	ND	ppbV	NC	25	
Chlorobenzene	ND	ND	ppbV	NC	25	



**Project Name:** OLIN **Project Number:** 861076

**Lab Number:** L0707334

**Report Date:** 06/11/07

arameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits	
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID	WG282495-3	QC Sample: L0707343-0	01 Client ID:	DUP Sample	
Chloroethane	ND	ND	ppbV	NC	25	
Chloroform	ND	ND	ppbV	NC	25	
Chloromethane	0.541	0.618	ppbV	13	25	
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25	
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25	
Dichlorodifluoromethane	ND	ND	ppbV	NC	25	
Ethylbenzene	ND	ND	ppbV	NC	25	
Freon-113	ND	ND	ppbV	NC	25	
Freon-114	ND	ND	ppbV	NC	25	
Hexachlorobutadiene	ND	ND	ppbV	NC	25	
Methylene chloride	2.08	1.94	ppbV	7	25	
p/m-Xylene	ND	ND	ppbV	NC	25	
o-Xylene	ND	ND	ppbV	NC	25	
Styrene	ND	ND	ppbV	NC	25	
Tetrachloroethene	ND	ND	ppbV	NC	25	
Toluene	ND	ND	ppbV	NC	25	
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25	
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25	
Trichloroethene	ND	ND	ppbV	NC	25	



Project Name: OLIN Batch Quality Cor Project Number: 861076 Lab Number:

L0707334

Report Date:

06/11/07

Parameter	Native Sample	Duplicate Sampl	le Units	RPD	RPD Limits
Volatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG282495-3 QC	Sample: L0707343-01	Client ID:	DUP Sample
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25

Yes

**Project Name:** OLIN Lab Number: L0707334

**Project Number:** 861076 **Report Date:** 06/11/07

**SAMPLE RESULTS** 

Lab ID: L0707334-02 Date Collected: 05/17/07 14:30

Date Received: Client ID: **EFFLUENT** 05/21/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified Matrix:

Anaytical Method: 43,DRAFT 1

Air

Analytical Date: 06/08/07 11:06

Analyst: НМ

### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone: Unknown <=10%

Sampling Flow Meter RPD of pre & post-sampling calibration check: Yes Were all QA/QC procedures REQUIRED by the method followed?

Were significant modifications made to the method as specified in Sect 11.3? No

Were all performance/acceptance standards for the required procedures achieved?

Parameter	Result	Qualifier	Units	RDL	Dilution Factor
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	293		ug/m3	24.0	1
C9-C12 Aliphatics	629		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	293		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	624		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0707334

 Project Number:
 861076
 Report Date:
 06/11/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 06/07/07 21:53

Analyst: HM

Parameter	Result	Qι	ıalifier	Units	RDL
etroleum Hydrocarbons in Air for s	sample(s):	02	Batch:	WG282746-5	
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: OLIN
Project Number: 861076

Lab Number: L0707334

**Report Date:** 06/11/07

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated	sample(s): 02 Bat	ch: WG282746-4			
1,3-Butadiene	89	-	70-130	-	
Methyl tert butyl ether	98	-	70-130	-	
Benzene	111	-	70-130	-	
Toluene	110	-	70-130	-	
Ethylbenzene	110	-	70-130	-	
p/m-Xylene	102	-	70-130	-	
o-Xylene	112	-	70-130	-	
Naphthalene	104	-	70-130	-	
2-Methylnaphthalene	108	-	70-130	-	
C5-C8 Aliphatics, Adjusted	97	-	70-130	-	
C9-C12 Aliphatics, Adjusted	104	-	70-130	-	
C9-C10 Aromatics	118	-	70-130	-	

**Project Name:** OLIN **Project Number:** 861076

**Lab Number:** L0707334 **Report Date:** 06/11/07

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
Petroleum Hydrocarbons in Air Associated sample(s):	02 QC Batch ID: V	VG282746-3 QC Sample:	L0707572-01	Client ID: DUP S	Sample
C5-C8 Aliphatics	2690	4800	ug/m3	1	30
C9-C12 Aliphatics	1040	1690	ug/m3	13	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	ND	ND	ug/m3	NC	30
Toluene	ND	ND	ug/m3	NC	30
Ethylbenzene	ND	ND	ug/m3	NC	30
p/m-Xylene	ND	ND	ug/m3	NC	30
o-Xylene	ND	ND	ug/m3	NC	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	47.3	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	2690	4800	ug/m3	1	30
C9-C12 Aliphatics, Adjusted	945	1550	ug/m3	12	30
C9-C10 Aromatics	90.2	142	ug/m3	13	30

**Project Name:** OLIN **Project Number:** 861076

Lab Number: L0707334

**Report Date:** 06/11/07

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s): (	02 QC Batch ID: WC	G282746-6 QC Sample:	L0707855-01 (	Client ID: DUP S	Sample
C5-C8 Aliphatics	492	491	ug/m3	0	30
C9-C12 Aliphatics	238	228	ug/m3	4	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	5.71	5.79	ug/m3	1	30
Benzene	2.23	2.24	ug/m3	0	30
Toluene	9.84	9.65	ug/m3	2	30
Ethylbenzene	ND	ND	ug/m3	NC	30
p/m-Xylene	4.57	4.24	ug/m3	7	30
o-Xylene	ND	ND	ug/m3	NC	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	470	469	ug/m3	0	30
C9-C12 Aliphatics, Adjusted	207	198	ug/m3	4	30
C9-C10 Aromatics	30.3	30.4	ug/m3	0	30

Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

### **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Cooler Information** 

**Cooler Custody Seal** N/A Absent

**Container Information** 

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0707334-01A	Canister - 2.7 Liter	N/A	NA	NA	NA	Absent	TO-14
L0707334-02A	Canister - 2.7 Liter	N/A	NA	NA	NA	Absent	APH,TO-14



Project Name: OLIN Lab Number: L0707334
Project Number: 861076 Report Date: 06/11/07

#### **GLOSSARY**

### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NI Not Ignitable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
  - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified



Project Name: OLIN Lab Number: L0707334

Project Number: 861076 Report Date: 06/11/07

#### REFERENCES

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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### ANALYTICAL REPORT

Lab Number: L0709223

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 07/24/07

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (200305), NJ (MA935), RI (LAO00065), ME (2006012), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.



 Project Name:
 OLIN
 Lab Number:
 L0709223

 Project Number:
 681076
 Report Date:
 07/24/07

Alpha Sample IDClient IDSample LocationL0709223-01PRE CARBONWILMINGTON, MAL0709223-02EFFLUENTWILMINGTON, MA

Project Name:OLINLab Number:L0709223Project Number:681076Report Date:07/24/07

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

#### TO14

Re-analysis on dilution was required in order to quantitate sample L0709223-01 within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration. The sample was re-analyzed to obtain lower reporting limits.

The WG287499-4 LCS % recovery for Methylene Chloride is above method acceptance criteria and the LCS % recoveries for 1,2,4-Trichlorobenzene and Hexachlorobutadiene are below method acceptance criteria, but within overall method allowances.

The WG287499-6 LCS % recoveries for Bromoform and cis-1,3-Dichloropropene are above method acceptance criteria.

APH

L0709223-02 has Acetone, Hexanal, and Methylene Chloride present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

The WG287147-1 LCS % recovery for 2-Methylnaphthalene is below method acceptance criteria in the ICV/LCS, but within overall method allowances.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Title: Technical Director/Representative

ALPHA

Date: 07/24/07

### **AIR**



Project Name: OLIN Lab Number: L0709223

Project Number: 681076 Report Date: 07/24/07

**SAMPLE RESULTS** 

Lab ID: Date Collected: 06/26/07 13:15

Client ID: PRE CARBON Date Received: 06/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 07/18/07 21:24

Analyst: HM

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
2,4,4-trimethyl-1-pentene	58.9	5.00	270	22.9		10



Project Name: OLIN Lab Number: L0709223

Project Number: 681076 Report Date: 07/24/07

### **SAMPLE RESULTS**

Lab ID: L0709223-01 R Date Collected: 06/26/07 13:15

Client ID: PRE CARBON Date Received: 06/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 07/24/07 11:33

Analyst: HM

	ppbV ug/m3		3		Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	0.893	0.500	4.36	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	1.47	1.00	7.26	4.94		1



**Project Name:** Lab Number: OLIN L0709223 **Project Number:** 681076

Report Date: 07/24/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: L0709223-01 R 06/26/07 13:15

Client ID: PRE CARBON Date Received: 06/27/07 Field Prep: Sample Location: WILMINGTON, MA Not Specified

	ppbV		ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	0.544	0.500	4.16	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	4.34	1.00	15.0	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	0.592	0.500	4.01	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	0.651	0.500	3.65	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	6.30	0.500	28.9	2.29		1
2,4,4-trimethyl-1-pentene	>50	0.5	>229	2.29		1



Project Name: OLIN Lab Number: L0709223

Project Number: 681076 Report Date: 07/24/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 06/26/07 13:20

Client ID: EFFLUENT Date Received: 06/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 07/18/07 22:09

Analyst: HM

	ppbV ug/m3		3		Dilution	
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	1.59	0.500	4.19	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	0.724	0.500	1.49	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



**Project Name:** Lab Number: OLIN L0709223 **Project Number:** 681076

Report Date: 07/24/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: L0709223-02 06/26/07 13:20

Client ID: **EFFLUENT** Date Received: 06/27/07 Field Prep: Sample Location: WILMINGTON, MA Not Specified

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	9.18	1.00	31.8	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	ND	0.500	ND	2.29		1



Project Name: OLIN Lab Number: L0709223

Project Number: 681076 Report Date: 07/24/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 07/18/07 19:13

	ppb	<u>v</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	01-02 Batch:	WG287499-5			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0709223

Project Number: 681076 Report Date: 07/24/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 07/18/07 19:13

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	sample(s):	01-02 Batch:	WG287499-5			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	ND	0.500	ND	2.29		1



Project Name: OLIN Lab Number: L0709223

Project Number: 681076 Report Date: 07/24/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 07/24/07 10:43

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s): 01	Batch:	WG287499-7			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0709223

Project Number: 681076 Report Date: 07/24/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 07/24/07 10:43

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s): 01	Batch:	WG287499-7			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	ND	0.500	ND	2.29		1



Project Name: OLIN
Project Number: 681076

Lab Number:

L0709223

Report Date:

07/24/07

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air	Associated sample(s): 01-02	2 Batch: WG287499-4			
1,1,1-Trichloroethane	91	-	70-130	-	
1,1,2,2-Tetrachloroethane	90	-	70-130	-	
1,1,2-Trichloroethane	88	-	70-130	-	
1,1-Dichloroethane	81	-	70-130	-	
1,1-Dichloroethene	84	-	70-130	-	
1,2,4-Trichlorobenzene	62	-	70-130	-	
1,2,4-Trimethylbenzene	94	-	70-130	-	
1,2-Dibromoethane	95	-	70-130	-	
1,2-Dichlorobenzene	86	-	70-130	-	
1,2-Dichloroethane	93	-	70-130	-	
1,2-Dichloropropane	85	-	70-130	-	
1,3,5-Trimethylbenzene	91	-	70-130	-	
1,3-Butadiene	99	-	70-130	-	
1,3-Dichlorobenzene	91	-	70-130	-	
1,4-Dichlorobenzene	92	-	70-130	-	
1,4-Dioxane	81	-	70-130	-	
2,2,4-Trimethylpentane	95	-	70-130	-	
2-Butanone	80	-	70-130	-	
2-Hexanone	100	-	70-130	-	
3-Chloropropene	100	-	70-130	-	
4-Ethyltoluene	104	-	70-130	-	



07/24/07

## Lab Control Sample Analysis Batch Quality Control

Project Name: OLIN

Lab Number: L0709223

Report Date:

Project	Number:	681076

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Assoc	ciated sample(s): 01-02	Batch: WG287499-4			
Acetone	138	-	70-130	-	
Benzene	88	-	70-130	-	
Benzyl chloride	116	-	70-130	-	
Bromodichloromethane	93	-	70-130	-	
Bromoform	113	-	70-130	-	
Bromomethane	90	-	70-130	-	
Carbon disulfide	118	-	70-130	-	
Carbon tetrachloride	84	-	70-130	-	
Chlorobenzene	93	-	70-130	-	
Chloroethane	85	-	70-130	-	
Chloroform	77	-	70-130	-	
Chloromethane	93	-	70-130	-	
cis-1,2-Dichloroethene	72	-	70-130	-	
cis-1,3-Dichloropropene	97	-	70-130	-	
Cyclohexane	87	-	70-130	-	
Dibromochloromethane	107	-	70-130	-	
Dichlorodifluoromethane	92	-	70-130	-	
Ethyl Alcohol	100	-	70-130	-	
Ethyl Acetate	77	-	70-130	-	
Ethylbenzene	98	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	92	-	70-130	-	



Project Name: OLIN

Lab Number:

L0709223

**Project Number:** 681076

Report Date:

07/24/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
/olatile Organic Compounds in Air Associate	ed sample(s): 01-02	Batch: WG287499-4			
1,2-Dichloro-1,1,2,2-tetrafluoroethane	88	-	70-130	-	
Hexachlorobutadiene	59	-	70-130	-	
iso-Propyl Alcohol	93	-	70-130	-	
Methylene chloride	146	-	70-130	-	
4-Methyl-2-pentanone	91	-	70-130	-	
Methyl tert butyl ether	88	-	70-130	-	
p/m-Xylene	98	-	70-130	-	
o-Xylene	95	-	70-130	-	
n-Hexane	74	-	70-130	-	
Propylene	106	-	70-130	-	
Styrene	98	-	70-130	-	
Tetrachloroethene	108	-	70-130	-	
Tetrahydrofuran	102	-	70-130	-	
Toluene	98	-	70-130	-	
trans-1,2-Dichloroethene	81	-	70-130	-	
trans-1,3-Dichloropropene	86	-	70-130	-	
Trichloroethene	84	-	70-130	-	
Trichlorofluoromethane	94	-	70-130	-	
Vinyl acetate	75	-	70-130	-	
Vinyl bromide	44	-	70-130	-	
Vinyl chloride	88	-	70-130	-	



Project Name: OLIN

Project Number: 681076

Lab Number: L0709223

**Report Date:** 07/24/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air As	sociated sample(s): 01-02	Batch: WG287499-4			
2,4,4-Trimethyl-2-Pentene	115	-	70-130	-	
2,4,4-Trimethyl-1-Pentene	122	-	70-130	-	
1,2,3-Trichloropropane	92	-	70-130	-	
Naphthalene	80	-	70-130	-	
1,2,3-Trichlorobenzene	67	-	70-130	-	

olatile Organic Compounds in Air Associate	atile Organic Compounds in Air Associated sample(s): 01 Batch: WG287499-6								
1,1,1-Trichloroethane	121	-	70-130	-					
1,1,2,2-Tetrachloroethane	104	-	70-130	-					
1,1,2-Trichloroethane	115	-	70-130	-					
1,1-Dichloroethane	105	-	70-130	-					
1,1-Dichloroethene	104	-	70-130	-					
1,2,4-Trichlorobenzene	90	-	70-130	-					
1,2,4-Trimethylbenzene	110	-	70-130	-					
1,2-Dibromoethane	105	-	70-130	-					
1,2-Dichlorobenzene	99	-	70-130	-					



Project Name: OLIN
Project Number: 681076

Lab Number: L0709223

Report Date:

07/24/07

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air A	Associated sample(s): 01 Bate	ch: WG287499-6			
1,2-Dichloroethane	103	-	70-130	-	
1,2-Dichloropropane	116	-	70-130	-	
1,3,5-Trimethylbenzene	104	-	70-130	-	
1,3-Butadiene	116	-	70-130	-	
1,3-Dichlorobenzene	105	-	70-130	-	
1,4-Dichlorobenzene	106	-	70-130	-	
1,4-Dioxane	108	-	70-130	-	
2,2,4-Trimethylpentane	80	-	70-130	-	
2-Butanone	113	-	70-130	-	
2-Hexanone	124	-	70-130	-	
3-Chloropropene	94	-	70-130	-	
4-Ethyltoluene	114	-	70-130	-	
Acetone	116	-	70-130	-	
Benzene	103	-	70-130	-	
Benzyl chloride	111	-	70-130	-	
Bromodichloromethane	130	-	70-130	-	
Bromoform	131	-	70-130	-	
Bromomethane	101	-	70-130	-	
Carbon disulfide	148	-	70-130	-	
Carbon tetrachloride	115	-	70-130	-	
Chlorobenzene	104	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number:

L0709223 07/24/07

Report Date:

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Assoc	iated sample(s): 01 Ba	tch: WG287499-6			
Chloroethane	100	-	70-130	-	
Chloroform	113	-	70-130	-	
Chloromethane	121	-	70-130	-	
cis-1,2-Dichloroethene	112	-	70-130	-	
cis-1,3-Dichloropropene	136	-	70-130	-	
Cyclohexane	105	-	70-130	-	
Dibromochloromethane	127	-	70-130	-	
Dichlorodifluoromethane	115	-	70-130	-	
Ethyl Alcohol	116	-	70-130	-	
Ethyl Acetate	131	-	70-130	-	
Ethylbenzene	108	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	99	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	108	-	70-130	-	
Hexachlorobutadiene	89	-	70-130	-	
iso-Propyl Alcohol	114	-	70-130	-	
Methylene chloride	104	-	70-130	-	
4-Methyl-2-pentanone	133	-	70-130	-	
Methyl tert butyl ether	99	-	70-130	-	
p/m-Xylene	110	-	70-130	-	
o-Xylene	110	-	70-130	-	
n-Hexane	112	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number: L0709223

**Report Date:** 07/24/07

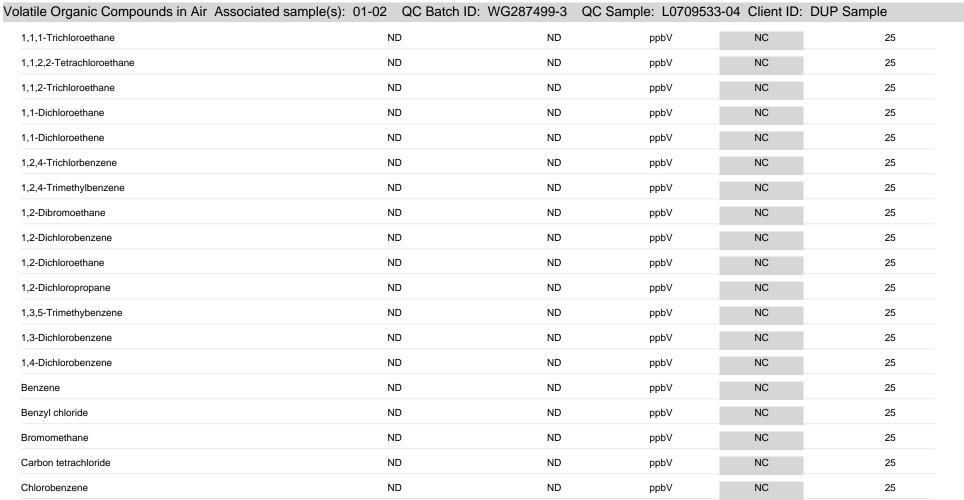
arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associated	d sample(s): 01	Batch: WG287499-6			
Propylene	125	-	70-130	-	
Styrene	104	-	70-130	-	
Tetrachloroethene	102	-	70-130	-	
Tetrahydrofuran	118	-	70-130	-	
Toluene	100	-	70-130	-	
trans-1,2-Dichloroethene	109	-	70-130	-	
trans-1,3-Dichloropropene	121	-	70-130	-	
Trichloroethene	111	-	70-130	-	
Trichlorofluoromethane	103	-	70-130	-	
Vinyl acetate	111	-	70-130	-	
Vinyl bromide	30	-	70-130	-	
Vinyl chloride	109	-	70-130	-	
2,4,4-Trimethyl-2-Pentene	100	-	70-130	-	
2,4,4-Trimethyl-1-Pentene	102	-	70-130	-	
1,2,3-Trichloropropane	90	-	70-130	-	
Naphthalene	80	-	70-130	-	
1,2,3-Trichlorobenzene	82	-	70-130	-	



Project Name: OLIN
Project Number: 681076

**Lab Number:** L0709223

Project Number:	681076				Report D	Oate: 07/24/07
Parameter		Native Sample	Duplicate Sample	Units	RPD	RPD Limits
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**Project Name:** OLIN Project Number: 681076 Lab Number: L0709223

07/24/07 Report Date:

arameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch I	D: WG287499-3	QC Sample: L0709533	3-04 Client ID:	DUP Sample
Chloroethane	ND	ND	ppbV	NC	25
Chloroform	0.509	0.589	ppbV	15	25
Chloromethane	0.660	0.766	ppbV	15	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Dichlorodifluoromethane	ND	ND	ppbV	NC	25
Ethylbenzene	ND	ND	ppbV	NC	25
Freon-113	ND	ND	ppbV	NC	25
Freon-114	ND	ND	ppbV	NC	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25
Methylene chloride	3.77	4.08	ppbV	8	25
p/m-Xylene	ND	ND	ppbV	NC	25
o-Xylene	ND	ND	ppbV	NC	25
Styrene	ND	ND	ppbV	NC	25
Tetrachloroethene	ND	ND	ppbV	NC	25
Toluene	ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichloroethene	ND	ND	ppbV	NC	25



Lab Number:

L0709223

Report Date:

07/24/07

Parameter	Native Sample	Duplicate Sam	ple Units	RPD	RPD Limits
Volatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG287499-3 Q	C Sample: L0709533-04	Client ID:	DUP Sample
Trichlorofluoromethane	ND	0.544	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25



**Project Name:** 

Project Number: 681076

OLIN

Project Name: OLIN Lab Number: L0709223

Project Number: 681076 Report Date: 07/24/07

**SAMPLE RESULTS** 

Lab ID: L0709223-02 Date Collected: 06/26/07 13:20

Client ID: EFFLUENT Date Received: 06/27/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 43,DRAFT 1 Analytical Date: 07/15/07 00:17

Analyst: HM

### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone:

Unknown

Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%
Were all QA/QC procedures REQUIRED by the method followed?

Yes

Were all performance/acceptance standards for the required procedures achieved?

No
Were significant modifications made to the method as specified in Sect 11.3?

No

Parameter	Result	Qualifier	Units	RDL	Dilution Facto
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	200		ug/m3	24.0	1
C9-C12 Aliphatics	970		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	200		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	970		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



**Project Name:** OLIN **Project Number:** 681076

Lab Number: L0709223

Report Date:

07/24/07

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated s	sample(s): 02	Batch: WG287147-1			
1,3-Butadiene	83	-	70-130	-	
Methyl tert butyl ether	90	-	70-130	-	
Benzene	90	-	70-130	-	
Toluene	98	-	70-130	-	
Ethylbenzene	94	-	70-130	-	
p/m-Xylene	92	-	70-130	-	
o-Xylene	89	-	70-130	-	
Naphthalene	65	-	50-150	-	
2-Methylnaphthalene	48	-	50-150	-	
C5-C8 Aliphatics, Adjusted	79	-	70-130	-	
C9-C12 Aliphatics, Adjusted	86	-	70-130	-	
C9-C10 Aromatics	106	-	70-130	-	



**Project Name:** OLIN Project Number: 681076 Lab Number: L0709223

07/24/07 Report Date:

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s): 02	2 QC Batch ID: WG28	37147-3 QC Sample:	L0709224-05 C	lient ID: DUP S	Sample
C5-C8 Aliphatics	61.4	62.2	ug/m3	1	30
C9-C12 Aliphatics	92.1	93.0	ug/m3	1	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	ND	ND	ug/m3	NC	30
Toluene	15.5	15.0	ug/m3	3	30
Ethylbenzene	ND	2.07	ug/m3	NC	30
p/m-Xylene	5.24	5.40	ug/m3	3	30
o-Xylene	ND	ND	ug/m3	NC	30
Naphthalene	3.19	3.28	ug/m3	3	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	40.6	39.8	ug/m3	2	30
C9-C12 Aliphatics, Adjusted	88.9	89.7	ug/m3	1	30
C9-C10 Aromatics	ND	ND	ug/m3	NC	30

Project Name: Lab Number: L0709223 OLIN

Project Number: 681076 **Report Date:** 07/24/07

### **Sample Receipt and Container Information**

YES Were project specific reporting limits specified?

**Cooler Information** 

Cooler **Custody Seal** 

**Container Information** 

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0709223-01A	Canister - 2.7 Liter	NA	NA	NA	Υ	Absent	TO-14
L0709223-02A	Canister - 6 Liter	NA	NA	NA	Υ	Absent	APH,TO-14



Project Name: OLIN Lab Number: L0709223
Project Number: 681076 Report Date: 07/24/07

#### **GLOSSARY**

#### Acronyms

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NI Not Ignitable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
  - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified

ALPHA WOODS HOLE LASS Project Name: OLIN Lab Number: L0709223
Project Number: 681076 Report Date: 07/24/07

#### REFERENCES

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

#### LIMITATION OF LIABILITIES

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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Fax:		Standar	м П	RUSH (onl)											
Email: /	of @Showing 19 (SU			i KOSH (oni)	у салпатеа и р	re-approved:)						AN	ALYSIS	5	
	ve been previously analyzed by Alpha			12	Time:					,	///	/ / /	77	/2/2/	
Other Project Sp	ecific Requirements/Comm	ents:		<u> </u>			<u>-</u>			/	//		10-134 70-15 SUMBES	CO COZ ONL	
* Include	2,44, trimeth	41-1-1	enter	Ne 4	- 2,4	4. Tr.	meth	V/.1	Part	ino /	//	GASES	/ / /s		
					, ,	, , , , ,		<i>y, G</i>	7 2011	7/	/ <i> </i> <b>≥</b> /			70/ 10/	
						T	1		T	<b>_</b> / <b>₽</b> /5	5 S		Z 2	\$ \S	
ALPHA Lab ID (Lab Use Only)	Sample ID	-		Collection Start Time	EndTime	Sample Matrix	Sampler's Initials	Can	ID-Flow Controller	0 0 0 2 4	70-15 APH	DISSOLVED GA	70-134 70-15 SU	Sample	Comments (i.e. PID)
0972301	Prz carbon	) (	676.07			Air	M	9450	• /	4				4	
1,-02	Effluent	4	6.2627		1320	A.T	R	4450	2		K			×	
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id William Company		Relinquis	shed By:		Date	e/Time	1	Receive	d By:		1/	Date/Tim	ie:	clock will n	ot start until any
	18	up			676	27/49	2 Mi		n-;		76/2	1-09	10	samples su	are resolved. All interest to
	FU	the			4/27/	02-184	Lou	Ke	10	en V	8/2	?7 '	18:4	Alpha's Pa	lyment Terms. See le.
Form No: 01-03 (rev. 28-NO)	V-06)						J		/					Sall Mark	



#### ANALYTICAL REPORT

Lab Number: L0710743

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 08/09/07



 Project Name:
 OLIN
 Lab Number:
 L0710743

 Project Number:
 681076
 Report Date:
 08/09/07

Alpha Sample IDClient IDSample LocationL0710743-01PRE CARBONWILMINGTON, MAL0710743-02EFFLUENTWILMINGTON, MA

 Project Name:
 OLIN
 Lab Number:
 L0710743

 Project Number:
 681076
 Report Date:
 08/09/07

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

#### TO14

L0710743-01 has elevated detection limits due to the dilution required by the elevated concentrations of target compounds in the sample.

L0710743-01 required re-analysis on dilution in order to quantitate the sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration.

The LCS % recovery for 1,2,4-Trichlorobenzene is below the individual acceptance criteria for the compounds, but within the overall method allowances.

#### **APH**

L0710743-02: Acetone, Methylene chloride, and 2-Butanone are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Kathelin M. opnin

Title: Technical Director/Representative



Date: 08/09/07

### **AIR**



Project Name: OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

### **SAMPLE RESULTS**

 Lab ID:
 L0710743-01
 Date Collected:
 07/25/07 13:00

 Client ID:
 PRE CARBON
 Date Received:
 07/26/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 08/09/07 05:36

Analyst: RY

	ppbV		ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	5.00	ND	27.2		10
1,1,2,2-Tetrachloroethane	ND	5.00	ND	34.3		10
1,1,2-Trichloroethane	ND	5.00	ND	27.2		10
1,1-Dichloroethane	ND	5.00	ND	20.2		10
1,1-Dichloroethene	ND	5.00	ND	19.8		10
1,2,4-Trichlorbenzene	ND	5.00	ND	37.1		10
1,2,4-Trimethylbenzene	ND	5.00	ND	24.6		10
1,2-Dibromoethane	ND	5.00	ND	38.4		10
1,2-Dichlorobenzene	ND	5.00	ND	30.0		10
1,2-Dichloroethane	ND	5.00	ND	20.2		10
1,2-Dichloropropane	ND	5.00	ND	23.1		10
1,3,5-Trimethybenzene	ND	5.00	ND	24.6		10
1,3-Dichlorobenzene	ND	5.00	ND	30.0		10
1,4-Dichlorobenzene	ND	5.00	ND	30.0		10
Benzene	ND	5.00	ND	16.0		10
Benzyl chloride	ND	5.00	ND	25.9		10
Bromomethane	ND	5.00	ND	19.4		10
Carbon tetrachloride	ND	5.00	ND	31.4		10
Chlorobenzene	ND	5.00	ND	23.0		10
Chloroethane	ND	5.00	ND	13.2		10
Chloroform	ND	5.00	ND	24.4		10
Chloromethane	ND	5.00	ND	10.3		10
cis-1,2-Dichloroethene	ND	5.00	ND	19.8		10
cis-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Dichlorodifluoromethane	ND	10.0	ND	49.4		10



Not Specified

Project Name: OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

### **SAMPLE RESULTS**

 Lab ID:
 L0710743-01
 Date Collected:
 07/25/07 13:00

 Client ID:
 PRE CARBON
 Date Received:
 07/26/07

Sample Location: WILMINGTON, MA Field Prep:

	ppbV	<u>'                                     </u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	5.00	ND	21.7		10
Freon-113	ND	5.00	ND	38.3		10
Freon-114	ND	5.00	ND	34.9		10
Hexachlorobutadiene	ND	5.00	ND	53.3		10
Methylene chloride	ND	10.0	ND	34.7		10
p/m-Xylene	ND	10.0	ND	43.4		10
o-Xylene	ND	5.00	ND	21.7		10
Styrene	ND	5.00	ND	21.3		10
Tetrachloroethene	ND	5.00	ND	33.9		10
Toluene	ND	5.00	ND	18.8		10
trans-1,2-Dichloroethene	ND	5.00	ND	19.8		10
trans-1,3-Dichloropropene	ND	5.00	ND	22.7		10
Trichloroethene	ND	5.00	ND	26.8		10
Trichlorofluoromethane	ND	5.00	ND	28.1		10
Vinyl chloride	ND	5.00	ND	12.8		10
2,4,4-trimethyl-2-pentene	225	5.00	1030	22.9		10
2,4,4-trimethyl-1-pentene	>500	5	>2294	22.9		10



Project Name: OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

**SAMPLE RESULTS** 

Lab ID: L0710743-01 R Date Collected: 07/25/07 13:00

Client ID: PRE CARBON Date Received: 07/26/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 08/09/07 07:59

Analyst: RY

	ppbV		ug/m3	<u> </u>		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
2,4,4-trimethyl-1-pentene	1420	20.0	6490	91.7		40



Project Name: OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 07/25/07 13:10

Client ID: EFFLUENT Date Received: 07/26/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 48,TO-14A Analytical Date: 08/09/07 06:21

Analyst: RY

	ppbV		ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	6.52	0.500	17.2	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	1.13	0.500	2.33	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	1.03	1.00	5.11	4.94		1



Project Name: OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

### **SAMPLE RESULTS**

Lab ID: L0710743-02 Date Collected: 07/25/07 13:10

Client ID: EFFLUENT Date Received: 07/26/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppb\	<u>/</u>	ug/m	3		Dilution Factor
Parameter	Results	RDL	Results	RDL	Qualifier	
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	1.20	1.00	4.18	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	2.21	0.500	10.1	2.29		1
2,4,4-trimethyl-1-pentene	9.87	0.500	45.3	2.29		1



**Project Name:** OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

# Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 08/08/07 20:16

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s):	01-02 Batch:	WG290081-2			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-14A Analytical Date: 08/08/07 20:16

	ppb	<u>v</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	01-02 Batch:	WG290081-2			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-trimethyl-2-pentene	ND	0.500	ND	2.29		1
2,4,4-trimethyl-1-pentene	ND	0.500	ND	2.29		1



Project Name: OLIN
Project Number: 681076

Lab Number: L0710743

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Asso	ociated sample(s): 01-02	2 Batch: WG290081-1			
1,1,1-Trichloroethane	119	-	70-130	-	
1,1,2,2-Tetrachloroethane	70	-	70-130	-	
1,1,2-Trichloroethane	95	-	70-130	-	
1,1-Dichloroethane	110	-	70-130	-	
1,1-Dichloroethene	98	-	70-130	-	
1,2,4-Trichlorobenzene	57	-	70-130	-	
1,2,4-Trimethylbenzene	88	-	70-130	-	
1,2-Dibromoethane	94	-	70-130	-	
1,2-Dichlorobenzene	72	-	70-130	-	
1,2-Dichloroethane	102	-	70-130	-	
1,2-Dichloropropane	105	-	70-130	-	
1,3,5-Trimethylbenzene	90	-	70-130	-	
1,3-Butadiene	107	-	70-130	-	
1,3-Dichlorobenzene	75	-	70-130	-	
1,4-Dichlorobenzene	72	-	70-130	-	
1,4-Dioxane	25	-	70-130	-	
2,2,4-Trimethylpentane	101	-	70-130	-	
2-Butanone	107	-	70-130	-	
2-Hexanone	103	-	70-130	-	
3-Chloropropene	106	-	70-130	-	
4-Ethyltoluene	104	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0710743

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	d sample(s): 01-0	2 Batch: WG290081-1			
Acetone	97	-	70-130	-	
Benzene	105	-	70-130	-	
Benzyl chloride	112	-	70-130	-	
Bromodichloromethane	106	-	70-130	-	
Bromoform	120	-	70-130	-	
Bromomethane	99	-	70-130	-	
Carbon disulfide	118	-	70-130	-	
Carbon tetrachloride	109	-	70-130	-	
Chlorobenzene	92	-	70-130	-	
Chloroethane	102	-	70-130	-	
Chloroform	106	-	70-130	-	
Chloromethane	96	-	70-130	-	
cis-1,2-Dichloroethene	104	-	70-130	-	
cis-1,3-Dichloropropene	105	-	70-130	-	
Cyclohexane	103	-	70-130	-	
Dibromochloromethane	113	-	70-130	-	
Dichlorodifluoromethane	92	-	70-130	-	
Ethyl Alcohol	52	-	70-130	-	
Ethyl Acetate	117	-	70-130	-	
Ethylbenzene	99	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	90	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0710743

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	ed sample(s): 01-02	Batch: WG290081-1			
1,2-Dichloro-1,1,2,2-tetrafluoroethane	96	-	70-130	-	
Hexachlorobutadiene	75	-	70-130	-	
iso-Propyl Alcohol	68	-	70-130	-	
Methylene chloride	96	-	70-130	-	
4-Methyl-2-pentanone	117	-	70-130	-	
Methyl tert butyl ether	102	-	70-130	-	
p/m-Xylene	100	-	70-130	-	
o-Xylene	96	-	70-130	-	
n-Hexane	95	-	70-130	-	
Propylene	97	-	70-130	-	
Styrene	87	-	70-130	-	
Tetrachloroethene	104	-	70-130	-	
Tetrahydrofuran	84	-	70-130	-	
Toluene	104	-	70-130	-	
trans-1,2-Dichloroethene	102	-	70-130	-	
trans-1,3-Dichloropropene	89	-	70-130	-	
Trichloroethene	103	-	70-130	-	
Trichlorofluoromethane	99	-	70-130	-	
Vinyl acetate	97	-	70-130	-	
Vinyl bromide	126	-	70-130	-	
Vinyl chloride	97	-	70-130	-	



**Project Name:** OLIN **Project Number:** 681076

Lab Number: L0710743

Report Date:

08/09/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Ass	sociated sample(s): 01-02	Batch: WG290081-1			
2,4,4-Trimethyl-2-Pentene	130	-	70-130	-	
2,4,4-Trimethyl-1-Pentene	126	-	70-130	-	
1,2,3-Trichloropropane	106	-	70-130	-	
Naphthalene	117	-	70-130	-	
1,2,3-Trichlorobenzene	140	-	70-130	-	



L0710743

# Lab Duplicate Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

ontrol Lab Number:

arameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG290081-3	QC Sample: L0710743-0	2 Client ID:	EFFLUENT
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorbenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	ND	ND	ppbV	NC	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
Benzene	ND	ND	ppbV	NC	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25



# Lab Duplicate Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

**Lab Number:** L0710743

arameter	Native Sample	Duplicate Sa	mple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID:	WG290081-3	QC Sample: L0710743-0	2 Client ID:	EFFLUENT
Chloroethane	6.52	6.30	ppbV	3	25
Chloroform	ND	ND	ppbV	NC	25
Chloromethane	1.13	1.11	ppbV	2	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Dichlorodifluoromethane	1.03	1.05	ppbV	2	25
Ethylbenzene	ND	ND	ppbV	NC	25
Freon-113	ND	ND	ppbV	NC	25
Freon-114	ND	ND	ppbV	NC	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25
Methylene chloride	1.20	1.03	ppbV	15	25
p/m-Xylene	ND	ND	ppbV	NC	25
o-Xylene	ND	ND	ppbV	NC	25
Styrene	ND	ND	ppbV	NC	25
Tetrachloroethene	ND	ND	ppbV	NC	25
Toluene	ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichloroethene	ND	ND	ppbV	NC	25



# Lab Duplicate Analysis Batch Quality Control

Lab Number:

L0710743

Report Date:

08/09/07

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
/olatile Organic Compounds in Air	Associated sample(s): 01-02 QC Batch ID	: WG290081-3 QC S	Sample: L0710743-0	2 Client ID:	EFFLUENT
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-trimethyl-2-pentene	2.21	2.32	ppbV	5	25
2,4,4-trimethyl-1-pentene	9.87	9.89	ppbV	0	25

**Project Name:** 

**Project Number:** 

OLIN

681076

Project Name: OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

**SAMPLE RESULTS** 

Lab ID: L0710743-02 Date Collected: 07/25/07 13:10

Client ID: EFFLUENT Date Received: 07/26/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified Matrix: Air

Anaytical Method: 43,DRAFT 1

Analytical Date: 08/07/07 13:24

Analyst: HM

### **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone: Unknown
Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%

Were all QA/QC procedures REQUIRED by the method followed?

Were all performance/acceptance standards for the required procedures achieved?

Yes

Were significant modifications made to the method as specified in Sect 11.3?

Parameter	Result	Qualifier	Units	RDL	Dilution Facto
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	461		ug/m3	24.0	1
C9-C12 Aliphatics	1490		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	461		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	1490		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



 Project Name:
 OLIN
 Lab Number:
 L0710743

 Project Number:
 681076
 Report Date:
 08/09/07

Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 08/07/07 12:27

Analyst: HM

Parameter	Result	Qι	ıalifier	Units	RDL
Petroleum Hydrocarbons in Air for	sample(s):	02	Batch:	WG289882-4	
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: OLIN
Project Number: 681076

Lab Number: L0710743

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sa	ample(s): 02 B	atch: WG289882-1			
1,3-Butadiene	103	-	70-130	-	
Methyl tert butyl ether	103	-	70-130	-	
Benzene	91	-	70-130	-	
Toluene	97	-	70-130	-	
Ethylbenzene	95	-	70-130	-	
p/m-Xylene	92	-	70-130	-	
o-Xylene	91	-	70-130	-	
Naphthalene	53	-	50-150	-	
2-Methylnaphthalene	54	-	50-150	-	
C5-C8 Aliphatics, Adjusted	96	-	70-130	-	
C9-C12 Aliphatics, Adjusted	100	-	70-130	-	
C9-C10 Aromatics	78	-	70-130	-	



# Lab Duplicate Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

Lab Number: L0710743

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s): 02	QC Batch ID: W	G289882-3 QC Sample:	L0710984-01	Client ID: DUP	Sample
C5-C8 Aliphatics	3350	3140	ug/m3	6	30
C9-C12 Aliphatics	73800	69000	ug/m3	7	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	ND	ND	ug/m3	NC	30
Benzene	ND	ND	ug/m3	NC	30
Toluene	ND	ND	ug/m3	NC	30
Ethylbenzene	ND	ND	ug/m3	NC	30
p/m-Xylene	ND	ND	ug/m3	NC	30
o-Xylene	ND	ND	ug/m3	NC	30
Naphthalene	ND	ND	ug/m3	NC	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	3350	3140	ug/m3	6	30
C9-C12 Aliphatics, Adjusted	70100	65700	ug/m3	6	30
C9-C10 Aromatics	3700	3320	ug/m3	11	30

**Project Name:** OLIN **Lab Number:** L0710743

Project Number: 681076 **Report Date:** 08/09/07

### **Sample Receipt and Container Information**

YES Were project specific reporting limits specified?

**Cooler Information** 

Cooler **Custody Seal** NA Absent

### **Container Information**

Container ID	Container Type	Cooler	рН	Temp I	Pres	Seal	Analysis
L0710743-01A	Canister - 6 Liter	NA	NA	NA	NA	Absent	TO-14
L0710743-02A	Canister - 6 Liter	NA	NA	NA	NA	Absent	APH,TO-14



 Project Name:
 OLIN
 Lab Number:
 L0710743

 Project Number:
 681076
 Report Date:
 08/09/07

#### **GLOSSARY**

### **Acronyms**

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NI Not Ignitable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
  - Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

#### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

#### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

Report Format: Not Specified

ALPHA WOODS HOLE LABS Project Name: OLIN Lab Number: L0710743

Project Number: 681076 Report Date: 08/09/07

#### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



		NALYSIS	PAGE_	OF	Date R	tec'd in Lal	:7/26	107	•	ALI	РНА .	Job#	:L0710743
WGODE HOLE LABS	CHAIN OF CUSTODY	Project Informati	tion		Repo	t Informat	tion - Data	Deliver	ables	Bill	ing In	forma	ition
Eight Walkup Drive TEL: 508-898-9220	Westborough, MA 01581 FAX: 508-898-9193	Project Name: 0 [	(۷)		□ FA	x				□ Sa	ame as	Client	info PO#:
Client Information Client: Shaw Address: 100 Tech Stoughton Phone: 617 - 1  Fax: Email: Dave, C	No hogy Center de No hogy Center de NA 02072 189-5567 Obb Othowarp Com	Project Location: L Project #: 67 Project Manager: ALPHA Quote #: Turn-Around Ti  Standard Standard Standard Tip Days To 13: 10 Days	1076 Nave C	confirmed if pre-approv	□ EM □ Add		on Regulatory C ats: ard pdf repo verables:	rt)	eated)	Res	gulato	ory Re	equirements/Report Limit Program Criteria
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### ANALYTICAL REPORT

Lab Number: L0712365

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 09/17/07

Certifications & Approvals: MA (M-MA086), NY NELAC (11148), CT (PH-0574), NH (200305), NJ (MA935), RI (LAO00065), ME (2006012), PA (Registration #68-03671), USDA (Permit #S-72578), US Army Corps of Engineers, Naval FESC.

Eight Walkup Drive, Westborough, MA 01581-1019 508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



 Project Name:
 OLIN
 Lab Number:
 L0712365

 Project Number:
 681076
 Report Date:
 09/17/07

Alpha Sample IDClient IDSample LocationL0712365-01PRE CARBONWILMINGTON, MAL0712365-02EFFLUENTWILMINGTON, MA



Project Name:OLINLab Number:L0712365Project Number:681076Report Date:09/17/07

#### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

#### TO-15

**APH** 

L0712365-01 required re-analysis on dilution in order to quantitate the sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration.

L0712365-02 and the associated laboratory duplicate were re-analyzed due to RPD failure. The results of the original duplicate are reported as the sample results, along with the results of the duplicate re-analysis.

L0712365-02: Acetone and 2-Butanone are present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

ature: With M. Main

Title: Technical Director/Representative Date: 09/17/07

### **AIR**



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 08/24/07 11:00

Client ID: PRE CARBON Date Received: 08/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 09/12/07 00:55

Analyst: HM

	ppbV	<u> </u>	ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	0.735	0.500	3.59	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

### **SAMPLE RESULTS**

 Lab ID:
 L0712365-01
 Date Collected:
 08/24/07 11:00

 Client ID:
 PRE CARBON
 Date Received:
 08/27/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppbV		ug/m3	<u> </u>		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	1.27	1.00	4.41	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	>100	0.5	>458	2.29		1
2,4,4-Trimethyl-1-Pentene	>100	0.5	>458	2.29		1



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

**SAMPLE RESULTS** 

Lab ID: L0712365-01 R Date Collected: 08/24/07 11:00

Client ID: PRE CARBON Date Received: 08/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 09/12/07 13:42

Analyst: HM

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
2,4,4-Trimethyl-2-Pentene	378	34.2	1730	157		68.44
2,4,4-Trimethyl-1-Pentene	2390	34.2	10900	157		68.44



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 08/24/07 11:15

Client ID: EFFLUENT Date Received: 08/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 09/12/07 02:06

Analyst: HM

	ppbV	<u> </u>	ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	12.4	0.500	32.7	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	2.73	0.500	5.63	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	1.23	1.00	6.08	4.94		1



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

### **SAMPLE RESULTS**

Lab ID: Date Collected: 08/24/07 11:15

Client ID: EFFLUENT Date Received: 08/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

ppbV		ug/m	3		Dilution
Results	RDL	Results	RDL	Qualifier	Factor
ND	0.500	ND	2.17		1
ND	0.500	ND	3.83		1
ND	0.500	ND	3.49		1
ND	0.500	ND	5.33		1
ND	1.00	ND	3.47		1
ND	1.00	ND	4.34		1
ND	0.500	ND	2.17		1
ND	0.500	ND	2.13		1
ND	0.500	ND	3.39		1
ND	0.500	ND	1.88		1
ND	0.500	ND	1.98		1
ND	0.500	ND	2.27		1
ND	0.500	ND	2.68		1
ND	0.500	ND	2.81		1
ND	0.500	ND	1.28		1
ND	0.500	ND	2.29		1
2.30	0.500	10.6	2.29		1
	Results  ND ND ND ND ND ND ND ND ND ND ND ND ND	Results   RDL	Results         RDL         Results           ND         0.500         ND           ND         0.500         ND           ND         0.500         ND           ND         0.500         ND           ND         1.00         ND           ND         1.00         ND           ND         0.500         ND	Results         RDL         Results         RDL           ND         0.500         ND         2.17           ND         0.500         ND         3.83           ND         0.500         ND         3.49           ND         0.500         ND         5.33           ND         1.00         ND         3.47           ND         1.00         ND         4.34           ND         0.500         ND         2.17           ND         0.500         ND         2.13           ND         0.500         ND         3.39           ND         0.500         ND         1.88           ND         0.500         ND         1.98           ND         0.500         ND         2.27           ND         0.500         ND         2.68           ND         0.500         ND         2.81           ND         0.500         ND         1.28           ND         0.500         ND         2.29	Results         RDL         Results         RDL         Qualifier           ND         0.500         ND         2.17           ND         0.500         ND         3.83           ND         0.500         ND         3.49           ND         0.500         ND         5.33           ND         1.00         ND         3.47           ND         1.00         ND         4.34           ND         0.500         ND         2.17           ND         0.500         ND         2.13           ND         0.500         ND         3.39           ND         0.500         ND         1.88           ND         0.500         ND         1.98           ND         0.500         ND         2.27           ND         0.500         ND         2.68           ND         0.500         ND         2.81           ND         0.500         ND         1.28           ND         0.500         ND         1.28           ND         0.500         ND         2.29



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 09/11/07 12:07

	ppb	V	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	sample(s):	01-02 Batch:	WG293947-3			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 09/11/07 12:07

	ppb	<u>v</u>	ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s):	01-02 Batch:	WG293947-3			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 09/12/07 10:46

	ppbV		ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s): 01	Batch:	WG293947-7			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

### Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 09/12/07 10:46

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s): 01	Batch:	WG293947-7			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



Project Name: OLIN
Project Number: 681076

Lab Number: L0712365

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
/olatile Organic Compounds in Air Associate	ed sample(s): 01-02	Batch: WG293947-2			
1,1,1-Trichloroethane	99	-	70-130	-	
1,1,2,2-Tetrachloroethane	110	-	70-130	-	
1,1,2-Trichloroethane	106	-	70-130	-	
1,1-Dichloroethane	108	-	70-130	-	
1,1-Dichloroethene	108	-	70-130	-	
1,2,4-Trichlorobenzene	98	-	70-130	-	
1,2,4-Trimethylbenzene	116	-	70-130	-	
1,2-Dibromoethane	112	-	70-130	-	
1,2-Dichlorobenzene	113	-	70-130	-	
1,2-Dichloroethane	108	-	70-130	-	
1,2-Dichloropropane	97	-	70-130	-	
1,3,5-Trimethylbenzene	115	-	70-130	-	
1,3-Butadiene	100	-	70-130	-	
1,3-Dichlorobenzene	113	-	70-130	-	
1,4-Dichlorobenzene	113	-	70-130	-	
1,4-Dioxane	107	-	70-130	-	
2,2,4-Trimethylpentane	92	-	70-130	-	
2-Butanone	114	-	70-130	-	
2-Hexanone	111	-	70-130	-	
3-Chloropropene	106	-	70-130	-	
4-Ethyltoluene	115	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number: L0712365

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associa	ated sample(s): 01-02	Batch: WG293947-2			
Acetone	105	-	70-130	-	
Benzene	99	-	70-130	-	
Benzyl chloride	114	-	70-130	-	
Bromodichloromethane	99	-	70-130	-	
Bromoform	108	-	70-130	-	
Bromomethane	101	-	70-130	-	
Carbon disulfide	100	-	70-130	-	
Carbon tetrachloride	97	-	70-130	-	
Chlorobenzene	104	-	70-130	-	
Chloroethane	105	-	70-130	-	
Chloroform	106	-	70-130	-	
Chloromethane	104	-	70-130	-	
cis-1,2-Dichloroethene	107	-	70-130	-	
cis-1,3-Dichloropropene	105	-	70-130	-	
Cyclohexane	104	-	70-130	-	
Dibromochloromethane	112	-	70-130	-	
Dichlorodifluoromethane	103	-	70-130	-	
Ethyl Alcohol	114	-	70-130	-	
Ethyl Acetate	112	-	70-130	-	
Ethylbenzene	111	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	105	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0712365

rameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
platile Organic Compounds in Air	Associated sample(s): 01-0	2 Batch: WG293947-2			
1,2-Dichloro-1,1,2,2-tetrafluoroethane	105	-	70-130	-	
Hexachlorobutadiene	100	-	70-130	-	
iso-Propyl Alcohol	107	-	70-130	-	
Methylene chloride	99	-	70-130	-	
4-Methyl-2-pentanone	106	-	70-130	-	
Methyl tert butyl ether	115	-	70-130	-	
p/m-Xylene	111	-	70-130	-	
o-Xylene	112	-	70-130	-	
Heptane	96	-	70-130	-	
n-Hexane	101	-	70-130	-	
Propylene	101	-	70-130	-	
Styrene	114	-	70-130	-	
Tetrachloroethene	109	-	70-130	-	
Tetrahydrofuran	105	-	70-130	-	
Toluene	107	-	70-130	-	
trans-1,2-Dichloroethene	105	-	70-130	-	
trans-1,3-Dichloropropene	104	-	70-130	-	
Trichloroethene	103	-	70-130	-	
Trichlorofluoromethane	105	-	70-130	-	
Vinyl acetate	113	-	70-130	-	
Vinyl bromide	106	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number:

L0712365

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Associate	d sample(s): 01-02	Batch: WG293947-2			
Vinyl chloride	104	-	70-130	-	
Naphthalene	109	-	70-130	-	
Dichlorofluoromethane	105	-	70-130	-	
2,4,4-Trimethyl-2-Pentene	102	-	70-130	-	
2,4,4-Trimethyl-1-Pentene	95	-	70-130	-	

atile Organic Compounds in Air Associated sample(s): 01 Batch: WG293947-6							
1,1,1-Trichloroethane	96	-	70-130	-			
1,1,2,2-Tetrachloroethane	104	-	70-130	•			
1,1,2-Trichloroethane	101	-	70-130	-			
1,1-Dichloroethane	104	-	70-130	-			
1,1-Dichloroethene	111	-	70-130	•			
1,2,4-Trichlorobenzene	97	-	70-130	•			
1,2,4-Trimethylbenzene	112	-	70-130	-			
1,2-Dibromoethane	108	-	70-130	•			
1,2-Dichlorobenzene	109	-	70-130	-			



Project Name: OLIN
Project Number: 681076

Lab Number:

L0712365

Report Date:

09/17/07

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Ass	ociated sample(s): 01 Ba	tch: WG293947-6			
1,2-Dichloroethane	105	-	70-130	-	
1,2-Dichloropropane	123	-	70-130	-	
1,3,5-Trimethylbenzene	113	-	70-130	-	
1,3-Butadiene	97	-	70-130	-	
1,3-Dichlorobenzene	111	-	70-130	-	
1,4-Dichlorobenzene	111	-	70-130	-	
1,4-Dioxane	100	-	70-130	-	
2,2,4-Trimethylpentane	100	-	70-130	-	
2-Butanone	109	-	70-130	-	
2-Hexanone	106	-	70-130	-	
3-Chloropropene	108	-	70-130	-	
4-Ethyltoluene	110	-	70-130	-	
Acetone	114	-	70-130	-	
Benzene	98	-	70-130	-	
Benzyl chloride	112	-	70-130	-	
Bromodichloromethane	98	-	70-130	-	
Bromoform	107	-	70-130	-	
Bromomethane	101	-	70-130	-	
Carbon disulfide	99	-	70-130	-	
Carbon tetrachloride	94	-	70-130	-	
Chlorobenzene	103	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0712365

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Assoc	ciated sample(s): 01 B	atch: WG293947-6			
Chloroethane	103	-	70-130	-	
Chloroform	103	-	70-130	-	
Chloromethane	105	-	70-130	-	
cis-1,2-Dichloroethene	105	-	70-130	-	
cis-1,3-Dichloropropene	104	-	70-130	-	
Cyclohexane	101	-	70-130	-	
Dibromochloromethane	108	-	70-130	-	
Dichlorodifluoromethane	120	-	70-130	-	
Ethyl Alcohol	109	-	70-130	-	
Ethyl Acetate	102	-	70-130	-	
Ethylbenzene	108	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	102	-	70-130	-	
1,2-Dichloro-1,1,2,2-tetrafluoroethane	102	-	70-130	-	
Hexachlorobutadiene	107	-	70-130	-	
iso-Propyl Alcohol	94	-	70-130	-	
Methylene chloride	95	-	70-130	-	
4-Methyl-2-pentanone	103	-	70-130	-	
Methyl tert butyl ether	113	-	70-130	-	
p/m-Xylene	108	-	70-130	-	
o-Xylene	109	-	70-130	-	
Heptane	94	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number: L0712365

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air Associated	d sample(s): 01	Batch: WG293947-6			
n-Hexane	100	-	70-130	-	
Propylene	101	-	70-130	-	
Styrene	109	-	70-130	-	
Tetrachloroethene	106	-	70-130	-	
Tetrahydrofuran	100	-	70-130	-	
Toluene	107	-	70-130	-	
trans-1,2-Dichloroethene	103	-	70-130	-	
trans-1,3-Dichloropropene	99	-	70-130	-	
Trichloroethene	102	-	70-130	-	
Trichlorofluoromethane	103	-	70-130	-	
Vinyl acetate	111	-	70-130	-	
Vinyl bromide	106	-	70-130	-	
Vinyl chloride	103	-	70-130	-	
Naphthalene	117	-	70-130	-	
Dichlorofluoromethane	107	-	70-130	-	
2,4,4-Trimethyl-2-Pentene	107	-	70-130	-	
2,4,4-Trimethyl-1-Pentene	97	-	70-130	-	



L0712365

# Lab Duplicate Analysis Batch Quality Control

**Project Name:** OLIN **Project Number:** 681076

lity Control Lab Number:

Report Date:

09/17/07

arameter	Native Sample	Duplicate Sa	ample Units	RPD	RPD Limits
platile Organic Compounds in Air Associated sample(s	): 01-02 QC Batch ID:	WG293947-4	QC Sample: L0712365	i-02 Client ID:	EFFLUENT
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorbenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	ND	ND	ppbV	NC	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
Benzene	ND	ND	ppbV	NC	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25



**Project Name:** OLIN **Project Number:** 681076 Lab Number: 09/17/07

L0712365

**Report Date:** 

**RPD RPD Limits Native Sample Duplicate Sample** Units **Parameter** Volatile Organic Compounds in Air Associated sample(s): 01-02 QC Batch ID: WG293947-4 QC Sample: L0712365-02 Client ID: EFFLUENT Chloroethane 12.4 12.4 ppbV 0 25 Chloroform ND ND ppbV NC 25 Chloromethane 2.73 2.81 ppbV 25 cis-1,2-Dichloroethene ND ND ppbV NC 25 cis-1,3-Dichloropropene ND ND ppbV NC 25 Dichlorodifluoromethane 1.23 1.24 ppbV 25 Ethylbenzene ND ND ppbV NC 25 Freon-113 ND ND ppbV NC 25 Freon-114 ND ND ppbV NC 25 Hexachlorobutadiene ND ND ppbV NC 25 Methylene chloride ND 1.17 ppbV NC 25 p/m-Xylene ND ND ppbV NC 25 o-Xylene ND ND ppbV NC 25 Styrene ND ND ppbV NC 25 Tetrachloroethene ND ND ppbV NC 25 Toluene ND ND ppbV NC 25 trans-1,2-Dichloroethene ND ND ppbV NC 25 trans-1,3-Dichloropropene ND ND ppbV NC 25 Trichloroethene ND ND ppbV NC 25



Lab Number:

L0712365 09/17/07

Report Date:

Parameter	Native Sample	Duplicate Sample	e Units	RPD	RPD Limits
Volatile Organic Compounds in Air A	ssociated sample(s): 01-02 QC Batch ID:	WG293947-4 QC S	Sample: L0712365-	02 Client ID:	EFFLUENT
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-2-Pentene	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-1-Pentene	2.30	1.96	ppbV	16	25

**Project Name:** 

Project Number:

OLIN

681076

No

Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

**SAMPLE RESULTS** 

Lab ID: L0712365-02 Date Collected: 08/24/07 11:15

Client ID: EFFLUENT Date Received: 08/27/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 43,DRAFT 1 Analytical Date: 08/27/07 18:09

Analyst: HM

## **Quality Control Information**

Sample Type: Grab

Sample Container Type:

Sampling Flow Controller:

Mechanical

Sampling Zone:

Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Were all QA/QC procedures REQUIRED by the method followed?

Were all performance/acceptance standards for the required procedures achieved?

Yes

Were significant modifications made to the method as specified in Sect 11.3?

**Parameter** Result Qualifier Units **RDL Dilution Factor** Petroleum Hydrocarbons in Air C5-C8 Aliphatics 236 24.0 ug/m3 1 1 690 28.0 C9-C12 Aliphatics ug/m3 1,3-Butadiene ND ug/m3 2.00 1 ND Methyl tert butyl ether ug/m3 2.00 1 ND 1 Benzene 2.00 ug/m3 Toluene ND ug/m3 2.00 1 Ethylbenzene ND ug/m3 2.00 1 p/m-Xylene ND ug/m3 4.00 1 ND ug/m3 2.00 1 o-Xylene Naphthalene ND ug/m3 2.00 1 ND 2-Methylnaphthalene ug/m3 8.00 1 234 24.0 C5-C8 Aliphatics, Adjusted ug/m3 1 C9-C12 Aliphatics, Adjusted 681 ug/m3 28.0 1 C9-C10 Aromatics ND ug/m3 24.0 1



 Project Name:
 OLIN
 Lab Number:
 L0712365

 Project Number:
 681076
 Report Date:
 09/17/07

Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 08/27/07 10:37

Analyst: HM

Parameter	Result	Qι	ıalifier	Units	RDL
Petroleum Hydrocarbons in Air for	sample(s):	02	Batch:	WG292036-3	
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: OLIN
Project Number: 681076

Lab Number:

L0712365

Report Date:

09/17/07

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
etroleum Hydrocarbons in Air Associat	ed sample(s): 02 Batc	h: WG292036-2			
1,3-Butadiene	108	-	70-130	-	
Methyl tert butyl ether	113	-	70-130	-	
Benzene	128	-	70-130	-	
Toluene	108	-	70-130	-	
Ethylbenzene	109	-	70-130	-	
p/m-Xylene	103	-	70-130	-	
o-Xylene	104	-	70-130	-	
Naphthalene	56	-	50-150	-	
2-Methylnaphthalene	58	-	50-150	-	
C5-C8 Aliphatics, Adjusted	101	-	70-130	-	
C9-C12 Aliphatics, Adjusted	97	-	70-130	-	
C9-C10 Aromatics	103	-	70-130	-	



**Project Name:** OLIN **Project Number:** 681076

 V Control
 Lab Number:
 L0712365

 Report Date:
 09/17/07

Parameter	Native Sample Du	uplicate Sample	Units	RPD	RPD Limits
Petroleum Hydrocarbons in Air Associated sample(s): 02	QC Batch ID: WG292036	6-4 QC Sample:	L0711887-01	Client ID: DUP Sa	ample
C5-C8 Aliphatics	514	519	ug/m3	1	30
C9-C12 Aliphatics	288	297	ug/m3	3	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	3.56	3.55	ug/m3	0	30
Benzene	3.32	3.26	ug/m3	2	30
Toluene	72.4	72.4	ug/m3	0	30
Ethylbenzene	10.2	10.1	ug/m3	1	30
p/m-Xylene	16.9	16.8	ug/m3	1	30
o-Xylene	6.00	5.91	ug/m3	2	30
Naphthalene	2.72	2.74	ug/m3	1	30
2-Methylnaphthalene	26.5	27.8	ug/m3	5	30
C5-C8 Aliphatics, Adjusted	402	410	ug/m3	2	30
C9-C12 Aliphatics, Adjusted	234	243	ug/m3	4	30
C9-C10 Aromatics	51.3	51.6	ug/m3	1	30



Project Name: OLIN Lab Number: L0712365

Project Number: 681076 Report Date: 09/17/07

## **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Cooler Information** 

Cooler Custody Seal NA Absent

## **Container Information**

Container ID	Container Type	Cooler	рН	Temp	Pres	Seal	Analysis
L0712365-01A	Canister - 2.7 Liter	NA	NA	NA	NA	Absent	TO-15
L0712365-02A	Canister - 6 Liter	NA	NA	NA	NA	Absent	APH,TO-15



Project Name:OLINLab Number:L0712365Project Number:681076Report Date:09/17/07

### **GLOSSARY**

### Acronyms

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NI Not Ignitable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

### Standard Qualifiers

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

Report Format: Data Usability Report



Project Name: OLIN Lab Number: L0712365
Project Number: 681076 Report Date: 09/17/07

### **REFERENCES**

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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Page 31 of 31



## ANALYTICAL REPORT

Lab Number: L0714281

Client: Shaw E & I

100 Technology Center Drive

Stoughton, MA 02072

ATTN: David Cobb

Project Name: OLIN
Project Number: 681076
Report Date: 10/11/07

Certifications & Approvals: MA (M-MA030), NY (11627), CT (PH-0141), NH (2206), NJ (MA015), RI (LAO00299), ME (MA0030), PA (Registration #68-02089), LA NELAC (03090), FL NELAC (E87814), US Army Corps of Engineers.

320 Forbes Boulevard, Mansfield, MA 02048-1806 508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name:OLINLab Number:L0714281Project Number:681076Report Date:10/11/07

Alpha Sample IDClient IDSample LocationL0714281-01PRE CARBONWILMINGTON, MAL0714281-02EFFLUENTWILMINGTON, MA

Project Name:OLINLab Number:L0714281Project Number:681076Report Date:10/11/07

### **Case Narrative**

The samples were received in accordance with the chain of custody and no significant deviations were encountered during preparation or analysis unless otherwise noted below.

### TO15

L0714281-01 has elevated detection limits due to the dilutions required by the elevated concentrations of target compounds in the sample and required re-analysis on a dilution in order to quantitate the sample within the range of the calibration. The result is reported as a greater than value for the compound that exceeded the calibration on the initial analysis. The re-analysis was performed only for the compound which exceeded the range of the calibration.

The WG297519-2 LCS % recoveries for Chloromethane, Vinyl chloride, 1,3-Butadiene, Chloroethane, and Cyclohexane are above the individual acceptance criteria for the compounds, but within the overall method allowances.

### APH

L0714281-02 has Acetone and Methylene chloride present in the C5-C8 Aliphatic Hydrocarbon range. The response for these analytes was not included in the calculation of the C5-C8 range result since they are not petroleum hydrocarbons.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Kathle M. Main

Authorized Signature:

Title: Technical Director/Representative

Date: 10/11/07



## **AIR**



Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

## **SAMPLE RESULTS**

Lab ID: Date Collected: 09/26/07 14:00

Client ID: PRE CARBON Date Received: 09/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/10/07 13:05

Analyst: HM

	ppbV	<u>'</u>	ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	12.5	ND	68.1		25
1,1,2,2-Tetrachloroethane	ND	12.5	ND	85.7		25
1,1,2-Trichloroethane	ND	12.5	ND	68.1		25
1,1-Dichloroethane	ND	12.5	ND	50.6		25
1,1-Dichloroethene	ND	12.5	ND	49.5		25
1,2,4-Trichlorbenzene	ND	12.5	ND	92.7		25
1,2,4-Trimethylbenzene	ND	12.5	ND	61.4		25
1,2-Dibromoethane	ND	12.5	ND	96.0		25
1,2-Dichlorobenzene	ND	12.5	ND	75.1		25
1,2-Dichloroethane	ND	12.5	ND	50.6		25
1,2-Dichloropropane	ND	12.5	ND	57.7		25
1,3,5-Trimethybenzene	ND	12.5	ND	61.4		25
1,3-Dichlorobenzene	ND	12.5	ND	75.1		25
1,4-Dichlorobenzene	ND	12.5	ND	75.1		25
Benzene	ND	12.5	ND	39.9		25
Benzyl chloride	ND	12.5	ND	64.7		25
Bromomethane	ND	12.5	ND	48.5		25
Carbon tetrachloride	ND	12.5	ND	78.6		25
Chlorobenzene	ND	12.5	ND	57.5		25
Chloroethane	ND	12.5	ND	33.0		25
Chloroform	ND	12.5	ND	61.0		25
Chloromethane	ND	12.5	ND	25.8		25
cis-1,2-Dichloroethene	ND	12.5	ND	49.5		25
cis-1,3-Dichloropropene	ND	12.5	ND	56.7		25
Dichlorodifluoromethane	ND	25.0	ND	124		25



Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

## **SAMPLE RESULTS**

Lab ID: Date Collected: 09/26/07 14:00

Client ID: PRE CARBON Date Received: 09/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppbV		ug/m	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	12.5	ND	54.2		25
Freon-113	ND	12.5	ND	95.7		25
Freon-114	ND	12.5	ND	87.3		25
Hexachlorobutadiene	ND	12.5	ND	133.		25
Methylene chloride	ND	25.0	ND	86.8		25
p/m-Xylene	ND	25.0	ND	108.		25
o-Xylene	ND	12.5	ND	54.2		25
Styrene	ND	12.5	ND	53.2		25
Tetrachloroethene	ND	12.5	ND	84.7		25
Toluene	ND	12.5	ND	47.1		25
trans-1,2-Dichloroethene	ND	12.5	ND	49.5		25
trans-1,3-Dichloropropene	ND	12.5	ND	56.7		25
Trichloroethene	ND	12.5	ND	67.1		25
Trichlorofluoromethane	ND	12.5	ND	70.2		25
Vinyl chloride	ND	12.5	ND	31.9		25
2,4,4-Trimethyl-2-Pentene	453	12.5	2080	57.3		25
2,4,4-Trimethyl-1-Pentene	>2500	12.5	>11474	57.3		25



Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

**SAMPLE RESULTS** 

Lab ID: L0714281-01 R Date Collected: 09/26/07 14:00

Client ID: PRE CARBON Date Received: 09/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/10/07 15:00

Analyst: HM

	ppbV		ug/m3	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
2,4,4-Trimethyl-1-Pentene	2870	25.1	13100	115		50.25



Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

## **SAMPLE RESULTS**

Lab ID: Date Collected: 09/26/07 13:50

Client ID: EFFLUENT Date Received: 09/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air
Anaytical Method: 48,TO-15
Analytical Date: 10/10/07 13:41

Analyst: HM

	ppbV	<u>'</u>	ug/m3	ug/m3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	5.51	0.500	14.5	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	1.44	0.500	2.98	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

## **SAMPLE RESULTS**

Lab ID: Date Collected: 09/26/07 13:50

Client ID: EFFLUENT Date Received: 09/27/07
Sample Location: WILMINGTON, MA Field Prep: Not Specified

	ppb\	<u>/</u>	ug/m	3		Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air						
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	1.19	1.00	4.12	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

## Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 10/10/07 12:19

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for	sample(s):	01-02 Batch:	WG297519-3			
1,1,1-Trichloroethane	ND	0.500	ND	2.72		1
1,1,2,2-Tetrachloroethane	ND	0.500	ND	3.43		1
1,1,2-Trichloroethane	ND	0.500	ND	2.72		1
1,1-Dichloroethane	ND	0.500	ND	2.02		1
1,1-Dichloroethene	ND	0.500	ND	1.98		1
1,2,4-Trichlorbenzene	ND	0.500	ND	3.71		1
1,2,4-Trimethylbenzene	ND	0.500	ND	2.46		1
1,2-Dibromoethane	ND	0.500	ND	3.84		1
1,2-Dichlorobenzene	ND	0.500	ND	3.00		1
1,2-Dichloroethane	ND	0.500	ND	2.02		1
1,2-Dichloropropane	ND	0.500	ND	2.31		1
1,3,5-Trimethybenzene	ND	0.500	ND	2.46		1
1,3-Dichlorobenzene	ND	0.500	ND	3.00		1
1,4-Dichlorobenzene	ND	0.500	ND	3.00		1
Benzene	ND	0.500	ND	1.60		1
Benzyl chloride	ND	0.500	ND	2.59		1
Bromomethane	ND	0.500	ND	1.94		1
Carbon tetrachloride	ND	0.500	ND	3.14		1
Chlorobenzene	ND	0.500	ND	2.30		1
Chloroethane	ND	0.500	ND	1.32		1
Chloroform	ND	0.500	ND	2.44		1
Chloromethane	ND	0.500	ND	1.03		1
cis-1,2-Dichloroethene	ND	0.500	ND	1.98		1
cis-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Dichlorodifluoromethane	ND	1.00	ND	4.94		1



Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

## Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15
Analytical Date: 10/10/07 12:19

	ppbV		ug/m3			Dilution
Parameter	Results	RDL	Results	RDL	Qualifier	Factor
Volatile Organic Compounds in Air for s	ample(s):	01-02 Batch:	WG297519-3			
Ethylbenzene	ND	0.500	ND	2.17		1
Freon-113	ND	0.500	ND	3.83		1
Freon-114	ND	0.500	ND	3.49		1
Hexachlorobutadiene	ND	0.500	ND	5.33		1
Methylene chloride	ND	1.00	ND	3.47		1
p/m-Xylene	ND	1.00	ND	4.34		1
o-Xylene	ND	0.500	ND	2.17		1
Styrene	ND	0.500	ND	2.13		1
Tetrachloroethene	ND	0.500	ND	3.39		1
Toluene	ND	0.500	ND	1.88		1
trans-1,2-Dichloroethene	ND	0.500	ND	1.98		1
trans-1,3-Dichloropropene	ND	0.500	ND	2.27		1
Trichloroethene	ND	0.500	ND	2.68		1
Trichlorofluoromethane	ND	0.500	ND	2.81		1
Vinyl chloride	ND	0.500	ND	1.28		1
2,4,4-Trimethyl-2-Pentene	ND	0.500	ND	2.29		1
2,4,4-Trimethyl-1-Pentene	ND	0.500	ND	2.29		1



Project Name: OLIN

**Project Number:** 681076

Lab Number: L0714281

**Report Date:** 10/11/07

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air Associate	ed sample(s): 01-02	Batch: WG297519-2			
1,1,1-Trichloroethane	119	-	70-130	-	
1,1,2,2-Tetrachloroethane	124	-	70-130	-	
1,1,2-Trichloroethane	122	-	70-130	-	
1,1-Dichloroethane	122	-	70-130	-	
1,1-Dichloroethene	126	-	70-130	-	
1,2,4-Trichlorobenzene	104	-	70-130	-	
1,2,4-Trimethylbenzene	115	-	70-130	-	
1,2-Dibromoethane	113	-	70-130	-	
1,2-Dichlorobenzene	117	-	70-130	-	
1,2-Dichloroethane	93	-	70-130	-	
1,2-Dichloropropane	126	-	70-130	-	
1,3,5-Trimethylbenzene	116	-	70-130	-	
1,3-Butadiene	137	-	70-130	-	
1,3-Dichlorobenzene	119	-	70-130	-	
1,4-Dichlorobenzene	119	-	70-130	-	
1,4-Dioxane	103	-	70-130	-	
2,2,4-Trimethylpentane	118	-	70-130	-	
2-Butanone	122	-	70-130	-	
2-Hexanone	120	-	70-130	-	
3-Chloropropene	120	-	70-130	-	
4-Ethyltoluene	118	-	70-130	-	

Project Name: OLIN
Project Number: 681076

Lab Number: L0714281

**Report Date:** 10/11/07

rameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
platile Organic Compounds in Air	Associated sample(s): 01-0	2 Batch: WG297519-2			
Acetone	107	-	70-130	-	
Benzene	124	-	70-130	-	
Benzyl chloride	116	-	70-130	-	
Bromodichloromethane	120	-	70-130	-	
Bromoform	110	-	70-130	-	
Bromomethane	125	-	70-130	-	
Carbon disulfide	130	-	70-130	-	
Carbon tetrachloride	122	-	70-130	-	
Chlorobenzene	117	-	70-130	-	
Chloroethane	134	-	70-130	-	
Chloroform	111	-	70-130	-	
Chloromethane	137	-	70-130	-	
cis-1,2-Dichloroethene	123	-	70-130	-	
cis-1,3-Dichloropropene	117	-	70-130	-	
Cyclohexane	133	-	70-130	-	
Dibromochloromethane	116	-	70-130	-	
Dichlorodifluoromethane	116	-	70-130	-	
Ethyl Alcohol	130	-	70-130	-	
Ethyl Acetate	113	-	70-130	-	
Ethylbenzene	120	-	70-130	-	
1,1,2-Trichloro-1,2,2-Trifluoroethane	119	-	70-130	-	



Project Name: OLIN
Project Number: 681076

Lab Number:

L0714281 10/11/07

Report Date:

arameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
olatile Organic Compounds in Air As	ssociated sample(s): 01-	02 Batch: WG297519-2			
1,2-Dichloro-1,1,2,2-tetrafluoroethane	100	-	70-130	-	
Hexachlorobutadiene	100	-	70-130	-	
iso-Propyl Alcohol	102	-	70-130	-	
Methylene chloride	130	-	70-130	-	
4-Methyl-2-pentanone	115	-	70-130	-	
Methyl tert butyl ether	103	-	70-130	-	
p/m-Xylene	120	-	70-130	-	
o-Xylene	121	-	70-130	-	
n-Heptane	128	-	70-130	-	
n-Hexane	129	-	70-130	-	
Propylene	118	-	70-130	-	
Styrene	121	-	70-130	-	
Tetrachloroethene	120	-	70-130	-	
Tetrahydrofuran	99	-	70-130	-	
Toluene	116	-	70-130	-	
trans-1,2-Dichloroethene	124	-	70-130	-	
trans-1,3-Dichloropropene	111	-	70-130	-	
Trichloroethene	124	-	70-130	-	
Trichlorofluoromethane	113	-	70-130	-	
Vinyl acetate	123	-	70-130	-	
Vinyl bromide	123	-	70-130	-	

10/11/07

# Lab Control Sample Analysis Batch Quality Control

Project Name: OLIN
Project Number: 681076

Lab Number: L0714281

Report Date:

rameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
platile Organic Compounds in Air As	ssociated sample(s): 01-02	Batch: WG297519-2			
Vinyl chloride	136	-	70-130	-	
Naphthalene	112	-	70-130	-	
Propane	129	-	70-130	-	
Acrylonitrile	129	-	70-130	-	
Acrolein	67	-	70-130	-	
1,1,1,2-Tetrachloroethane	120	-	70-130	-	
Isopropylbenzene	122	-	70-130	-	
1,2,3-Trichloropropane	122	-	70-130	-	
Acetonitrile	127	-	70-130	-	
Bromobenzene	118	-	70-130	-	
Chlorodifluoromethane	116	-	70-130	-	
Dichlorofluoromethane	126	-	70-130	-	
Dibromomethane	128	-	70-130	-	
Pentane	142	-	70-130	-	
Octane	134	-	70-130	-	
Tertiary-Amyl Methyl Ether	114	-	70-130	-	
o-Chlorotoluene	123	-	70-130	-	
p-Chlorotoluene	121	-	70-130	-	
2,2-Dichloropropane	109	-	70-130	-	
1,1-Dichloropropene	129	-	70-130	-	
Isopropyl Ether	131	-	70-130	-	



**Project Name:** OLIN **Project Number:** 681076

Lab Number: L0714281

Report Date: 10/11/07

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Volatile Organic Compounds in Air	Associated sample(s): 01-02	Batch: WG297519-2			
Ethyl-Tert-Butyl-Ether	94	-	70-130	-	
1,2,3-Trichlorobenzene	105	-	70-130	-	
Ethyl ether	127	-	70-130	-	
n-Butylbenzene	120	-	70-130	-	
sec-Butylbenzene	123	-	70-130	-	
tert-Butylbenzene	113	-	70-130	-	
1,2-Dibromo-3-chloropropane	107	-	70-130	-	
p-Isopropyltoluene	118	-	70-130	-	
n-Propylbenzene	125	-	70-130	-	
1,3-Dichloropropane	123	-	70-130	-	
Methanol	112	-	70-130	-	
Butane	139	-	70-130	-	
Nonane (C9)	126	-	70-130	-	
Decane (C10)	126	-	70-130	-	
Undecane	105	-	70-130	-	
Dodecane (C12)	95	-	70-130	-	
Butyl Acetate	124	-	70-130	-	
2,4,4-Trimethyl-2-Pentene	127	-	70-130	-	
2,4,4-Trimethyl-1-Pentene	117	-	70-130	-	



**Project Name:** OLIN **Project Number:** 681076

Lab Number: L0714281

**Report Date:** 10/11/07

arameter	Native Sample	Duplicate Sam	ple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID	: WG297519-4 C	QC Sample: L0714281-0	02 Client ID:	EFFLUENT
1,1,1-Trichloroethane	ND	ND	ppbV	NC	25
1,1,2,2-Tetrachloroethane	ND	ND	ppbV	NC	25
1,1,2-Trichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethane	ND	ND	ppbV	NC	25
1,1-Dichloroethene	ND	ND	ppbV	NC	25
1,2,4-Trichlorbenzene	ND	ND	ppbV	NC	25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC	25
1,2-Dibromoethane	ND	ND	ppbV	NC	25
1,2-Dichlorobenzene	ND	ND	ppbV	NC	25
1,2-Dichloroethane	ND	ND	ppbV	NC	25
1,2-Dichloropropane	ND	ND	ppbV	NC	25
1,3,5-Trimethybenzene	ND	ND	ppbV	NC	25
1,3-Dichlorobenzene	ND	ND	ppbV	NC	25
1,4-Dichlorobenzene	ND	ND	ppbV	NC	25
Benzene	ND	ND	ppbV	NC	25
Benzyl chloride	ND	ND	ppbV	NC	25
Bromomethane	ND	ND	ppbV	NC	25
Carbon tetrachloride	ND	ND	ppbV	NC	25
Chlorobenzene	ND	ND	ppbV	NC	25



**Project Name:** OLIN **Project Number:** 681076

Lab Number: L0714281

**Report Date:** 10/11/07

arameter	Native Sample	Duplicate Sar	nple Units	RPD	RPD Limits
olatile Organic Compounds in Air Associated sample(s)	: 01-02 QC Batch ID	: WG297519-4	QC Sample: L0714281-0	02 Client ID:	EFFLUENT
Chloroethane	5.51	4.43	ppbV	22	25
Chloroform	ND	ND	ppbV	NC	25
Chloromethane	1.44	1.12	ppbV	25	25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC	25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Dichlorodifluoromethane	ND	ND	ppbV	NC	25
Ethylbenzene	ND	ND	ppbV	NC	25
Freon-113	ND	ND	ppbV	NC	25
Freon-114	ND	ND	ppbV	NC	25
Hexachlorobutadiene	ND	ND	ppbV	NC	25
Methylene chloride	1.19	ND	ppbV	NC	25
p/m-Xylene	ND	ND	ppbV	NC	25
o-Xylene	ND	ND	ppbV	NC	25
Styrene	ND	ND	ppbV	NC	25
Tetrachloroethene	ND	ND	ppbV	NC	25
Toluene	ND	ND	ppbV	NC	25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC	25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC	25
Trichloroethene	ND	ND	ppbV	NC	25



Lab Number:

L0714281 10/11/07

Report Date:

Parameter	Native Sample	Duplicate Sample	e Units	RPD	RPD Limits
Volatile Organic Compounds in Air Associated sample	e(s): 01-02 QC Batch ID:	WG297519-4 QC	Sample: L0714281-	02 Client ID:	EFFLUENT
Trichlorofluoromethane	ND	ND	ppbV	NC	25
Vinyl chloride	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-2-Pentene	ND	ND	ppbV	NC	25
2,4,4-Trimethyl-1-Pentene	ND	ND	ppbV	NC	25

**Project Name:** 

Project Number: 681076

OLIN

Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

**SAMPLE RESULTS** 

Lab ID: L0714281-02 Date Collected: 09/26/07 13:50

Client ID: EFFLUENT Date Received: 09/27/07

Sample Location: WILMINGTON, MA Field Prep: Not Specified

Matrix: Air

Analytical Method: 43,DRAFT 1 Analytical Date: 10/02/07 14:56

Analyst: HM

## **Quality Control Information**

Sample Type: Grab

Sample Container Type: Canister - 2.7 Liter

Sampling Flow Controller: Mechanical

Sampling Zone:

Unknown

Sampling Flow Meter RPD of pre & post-sampling calibration check:

<=10%

Sampling Flow Meter RPD of pre & post-sampling calibration check: <=10%
Were all QA/QC procedures REQUIRED by the method followed?
Yes

Were all performance/acceptance standards for the required procedures achieved?

Were significant modifications made to the method as specified in Sect 11.3?

Parameter	Result	Qualifier	Units	RDL	Dilution Facto
Petroleum Hydrocarbons in Air					
C5-C8 Aliphatics	404		ug/m3	24.0	1
C9-C12 Aliphatics	1660		ug/m3	28.0	1
1,3-Butadiene	ND		ug/m3	2.00	1
Methyl tert butyl ether	ND		ug/m3	2.00	1
Benzene	ND		ug/m3	2.00	1
Toluene	ND		ug/m3	2.00	1
Ethylbenzene	ND		ug/m3	2.00	1
p/m-Xylene	ND		ug/m3	4.00	1
o-Xylene	ND		ug/m3	2.00	1
Naphthalene	ND		ug/m3	2.00	1
2-Methylnaphthalene	ND		ug/m3	8.00	1
C5-C8 Aliphatics, Adjusted	404		ug/m3	24.0	1
C9-C12 Aliphatics, Adjusted	1660		ug/m3	28.0	1
C9-C10 Aromatics	ND		ug/m3	24.0	1



Project Name:OLINLab Number:L0714281Project Number:681076Report Date:10/11/07

# Method Blank Analysis Batch Quality Control

Analytical Method: 43,DRAFT 1 Analytical Date: 10/02/07 11:38

Analyst: HM

Parameter	Result	Qı	ıalifier	Units	RDL
etroleum Hydrocarbons in Air fo	r sample(s):	02	Batch:	WG296513-3	
C5-C8 Aliphatics	ND			ug/m3	24.0
C9-C12 Aliphatics	ND			ug/m3	28.0
1,3-Butadiene	ND			ug/m3	2.00
Methyl tert butyl ether	ND			ug/m3	2.00
Benzene	ND			ug/m3	2.00
Toluene	ND			ug/m3	2.00
Ethylbenzene	ND			ug/m3	2.00
p/m-Xylene	ND			ug/m3	4.00
o-Xylene	ND			ug/m3	2.00
Naphthalene	ND			ug/m3	2.00
2-Methylnaphthalene	ND			ug/m3	8.00
C5-C8 Aliphatics, Adjusted	ND			ug/m3	24.0
C9-C12 Aliphatics, Adjusted	ND			ug/m3	28.0
C9-C10 Aromatics	ND			ug/m3	24.0



Project Name: OLIN
Project Number: 681076

Lab Number:

L0714281 10/11/07

Report Date:

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Petroleum Hydrocarbons in Air Associated sa	ample(s): 02 B	atch: WG296513-2			
1,3-Butadiene	88	-	70-130	-	
Methyl tert butyl ether	107	-	70-130	-	
Benzene	84	-	70-130	-	
Toluene	103	-	70-130	-	
Ethylbenzene	75	-	70-130	-	
p/m-Xylene	74	-	70-130	-	
o-Xylene	74	-	70-130	-	
Naphthalene	143	-	50-150	-	
2-Methylnaphthalene	89	-	50-150	-	
C5-C8 Aliphatics, Adjusted	94	-	70-130	-	
C9-C12 Aliphatics, Adjusted	127	-	70-130	-	
C9-C10 Aromatics	106	-	70-130	-	

**Project Name:** OLIN **Project Number:** 681076

**Lab Number:** L0714281 **Report Date:** 10/11/07

arameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
etroleum Hydrocarbons in Air Associated sample(s): 0	02 QC Batch ID: WG	6296513-4 QC Sample:	L0713962-01	Client ID: DUP S	ample
C5-C8 Aliphatics	606	815	ug/m3	29	30
C9-C12 Aliphatics	217	308	ug/m3	35	30
1,3-Butadiene	ND	ND	ug/m3	NC	30
Methyl tert butyl ether	2.13	2.81	ug/m3	28	30
Benzene	11.2	15.0	ug/m3	29	30
Toluene	77.6	105	ug/m3	30	30
Ethylbenzene	16.3	22.0	ug/m3	30	30
p/m-Xylene	46.8	62.2	ug/m3	28	30
o-Xylene	14.8	19.7	ug/m3	28	30
Naphthalene	3.14	4.12	ug/m3	27	30
2-Methylnaphthalene	ND	ND	ug/m3	NC	30
C5-C8 Aliphatics, Adjusted	437	588	ug/m3	29	30
C9-C12 Aliphatics, Adjusted	143	209	ug/m3	38	30
C9-C10 Aromatics	70.8	94.9	ug/m3	29	30

Project Name: OLIN Lab Number: L0714281

Project Number: 681076 Report Date: 10/11/07

## **Sample Receipt and Container Information**

Were project specific reporting limits specified?

**Cooler Information** 

**Cooler Custody Seal** N/A Absent

## **Container Information**

Container ID	Container Type	Cooler	рН	Temp Pres	Seal	Analysis
L0714281-01A	Canister - 2.7 Liter	NA	NA	NA	Absent	CAN-RENT0,TO-15
L0714281-02A	Canister - 6 Liter	NA	NA	NA	Absent	APH,CAN-RENT0,TO-15



Project Name: OLIN Lab Number: L0714281
Project Number: 681076 Report Date: 10/11/07

#### GLOSSARY

### Acronyms

- EPA Environmental Protection Agency.
- LCS Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
- LCSD- Laboratory Control Sample Duplicate: Refer to LCS.
- MS Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
- MSD Matrix Spike Sample Duplicate: Refer to MS.
- NA Not Applicable.
- NI Not Ignitable.
- NC Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
- ND Not detected at the reported detection limit for the sample.
- RDL Reported Detection Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
- RPD Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.

### **Terms**

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

### **Data Qualifiers**

The following data qualifiers have been identified for use under the CT DEP Reasonable Confidence Protocols.

- A Spectra identified as "Aldol Condensation Product".
- B The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte.
- E Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- J Estimated value. The analyte was tentatively identified; the quantitation is an estimation. (Tentatively identified compounds only.)

### Standard Qualifiers

H - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.

Report Format: Not Specified



Project Name: OLIN Lab Number: L0714281
Project Number: 681076 Report Date: 10/11/07

### REFERENCES

43 Method for the Determination of Air-Phase Petroleum Hydrocarbons (APH), Draft 1.0, Massachusetts Department of Environmental Protection, February 2000.

Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

### **LIMITATION OF LIABILITIES**

Alpha Woods Hole Labs performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Woods Hole Labs shall be to re-perform the work at it's own expense. In no event shall Alpha Woods Hole Labs be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Woods Hole Labs.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



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